The Milbank Memorial Fund

QUARTERLY

CONTENTS

	Page
In This Issue	3
Residence Histories of Deceased Persons *Monroe G. Sirken, William Haenszel* and *James W. Pifer*	5
Another Look at the Indianapolis Fertility Data *David Goldberg*	23
Class Fertility Differentials in England and Wales *Dennis H. Wrong*	37
Medical Care Plans as a Source of Morbidity Data: the prevalence of illness and associated volume of service *Paul M. Densen, Eve Balamuth* and *Neva R. Deardorff*	48
Annotations	
Africa: Its Peoples and Their Culture History — *Frank Lorimer*	102
American Marriage and Divorce — *Clyde V. Kiser*	107

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IN THIS ISSUE

UNTIL about twenty years ago deaths in the United States were allocated according to place of occurrence. The subsequent trend toward allocation to usual place of residence was stimulated partly by the increasing proportion of deaths occurring in hospitals and partly by the desire to achieve comparability with residence of the living population as given in the census. However, for special studies of specific diseases there are advantages in having lifetime residence histories of the decedents. A recent collaborative effort of the Pennsylvania Department of Health and the United States Public Health Service to collect and use such data is described in the paper "Residence Histories of Deceased Persons" by Monroe G. Sirken, William Haenszel, and James W. Pifer.

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In the paper "Another Look at the Indianapolis Fertility Data," Dr. David Goldberg explores the hypothesis that the presence of farm migrants in cities accounts for much of the tendency for birth rates in cities to be highest among the laborers and lowest among the white collar workers. In essential respects the data support the hypothesis. The occupational class differences in fertility were much weaker among the two-generation urbanites than among the migrants from farms residing in Indianapolis. The author discusses the findings and their significance for future trends and differentials in urban fertility.

• • •

Professor Dennis H. Wrong presents a paper "Class Fertility Trends in England and Wales," based largely upon data from

the 1951 Census of those countries. As in our own country, some narrowing of the class differences in fertility occurred during the thirties in the context of general declines in fertility. Also as in our country, a decided narrowing of fertility differentials occurred during the forties in the context of general increases in fertility. However, the 1951 data also indicate some resurgence of the nonmanual-manual differential in fertility among couples married under four years.

• • •

One measure of the health of a population is the amount of illness of different types for which the people sought service from a physician. In the article "Medical Care Plans as a Source of Morbidity Data; the Prevalence of Illness and Associated Volume of Service" by Paul M. Densen, Eve Balamuth and Neva R. Deardoff, the authors report rates for specific causes of illness and the number of contacts with a physician for care of different illnesses based on a ten per cent sample of the records for enrollees in the Health Insurance Plan of Greater New York in the years 1948–1951. Variation with age in the prevalence of different diseases and in the volume of physician service required for treatment is emphasized in the report. Data on morbidity in a population previously have been available chiefly from household surveys. Systematic studies of illness in an insured population can greatly increase present knowledge about the nature and extent of health problems and provide information useful in planning and administering health insurance programs.

RESIDENCE HISTORIES OF DECEASED PERSONS[1]

MONROE G. SIRKEN, WILLIAM HAENSZEL, AND JAMES W. PIFER[2]

INTRODUCTION

INFORMATION pertaining to the distribution of deaths by minor political subdivisions of states has always assumed major significance in national mortality tabulations. Up to about twenty years ago, deaths were allocated on a *de facto* basis according to place of occurrence. This method of allocation became increasingly inadequate with the growing trend toward hospital care, and the increasing number of deaths occurring in hospitals. Consequently, in recent years deaths have been allocated, with a few exceptions, on a *de jure* basis according to the usual place of residence of the deceased person as reported on the death certificate.

A primary consideration in allocating deaths on a *de jure* basis was to achieve comparability with the residence allocation of the population in decennial censuses. When both deaths and the living population were assigned on a consistent basis, it became more meaningful to compute mortality rates for geographic divisions, states, and minor political subdivisions of states. Mortality tabulations based on the *de jure* method of allocating deaths to places of residence do not serve all uses being made of them equally well. In epidemiologic studies of infectious diseases, for example, the place where the disease was contracted is more relevant than the usual place of residence of the person at the time of death. Even if deaths caused by infectious diseases could be allocated on this basis, however, there would remain the difficult problem of ascertaining the popula-

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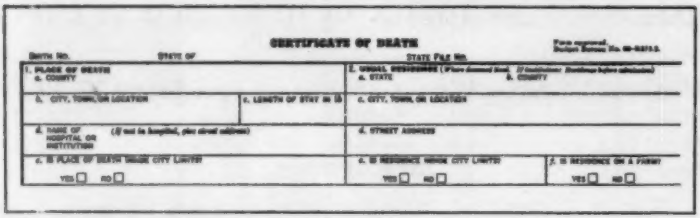


CERTIFICATE OF DEATH

Birth No. STATE OF STATE File No.

1. PLACE OF DEATH a. COUNTY		2. USUAL RESIDENCE a. STATE b. COUNTY
b. CITY, TOWN, OR LOCATION	c. LENGTH OF STAY IN (3)	c. CITY, TOWN, OR LOCATION
d. NAME OF HOSPITAL OR INSTITUTION (If not in hospital, give street address)		d. STREET ADDRESS
e. IS PLACE OF DEATH INSIDE CITY LIMITS? YES ☐ NO ☐		e. IS RESIDENCE INSIDE CITY LIMITS? YES ☐ NO ☐
		f. IS RESIDENCE ON A FARM? YES ☐ NO ☐

Fig. 1. Residence information reported on the 1956 revision of the standard certificate of death.

tion exposed to risk which would be needed in order to compute mortality rates.

In epidemiologic studies of diseases characterized by long latent periods preceding their clinical detection, information about the places where the deceased person resided for substantial periods during his lifetime is more relevant than information regarding his usual place of residence at time of death. In view of the highly mobile character of the United States population, there is a question whether residence tabulations based on *de jure* allocations of deceased persons according to the usual residence at death are adequate for epidemiologic studies of chronic diseases. One might ask the following questions about the usual place of residence at death: How permanent is it? How descriptive is it of the residence history of the deceased person? How do population groups compare in terms of the length of stay in the usual place of residence at death? This paper, based upon lifetime residence history reports of deceased persons, will provide tentative answers to these questions.

The standard certificate of death currently in use in the United States identifies the place in which the death occurred and the decedent's usual place of residence. (Figure 1.) Length of stay in the place of death is reported, but this information is not available for the usual place of residence. Consequently, complete lifetime residence histories would be available from death certificates only for decedents who had died in the same city, town, or rural place in which they had lived their entire lives.

Since residence histories are not reported on the death certificate, a pilot study, undertaken in the State of Pennsylvania, was used to (1) develop methods for the collection and analyses of residence data, and (2) obtain preliminary information for evaluating the limitations of the *de jure* basis of allocating deaths from the residence history viewpoint.

This survey, undertaken cooperatively by the Pennsylvania Department of Health and the United States Public Health Service, served primarily as a pilot study for a national epidemiologic investigation of lung cancer deaths. In addition to lifetime residence histories, information was collected concerning the smoking habits and occupation histories of deceased persons.

Survey Methods

Lifetime residence histories for a sample of about 1,700 deaths were collected by mail survey from family informants identified on death certificates. The deaths were selected with known probabilities from those registered in the vital statistics office of the Pennsylvania Department of Health during a three-month period, August through October, 1956. The sample consisted of all lung cancer deaths (about 600), and about ten per cent of the deaths attributed to other causes. Deaths at ages below 20 years, and about 10 per cent of the deaths at older ages which were attributed to such causes as accidents, poisonings, and homicides were eliminated from the sample.

Personal interviews were conducted in Standard Metropolitan Areas (SMA's) with family informants for a subsample of 400 decedents. The interviews were undertaken either as a followup with nonrespondents to the mail survey or as a quality check on the information reported in the mail survey. Since better quality residence history information was collected by personal interview than by mail query, the results presented in this report are based entirely upon the former.

The residence history data collected in this study identified the usual place of residence of the decedent at death and listed

Description of Deaths in Personal Interview Subsample	Sample Size	Per Cent
Deaths In Personal Interview Survey	482	100
Deaths Included In Tabulations	349	72
Deaths Not Included In Tabulations	133	28
Personal Interview Not Attempted Because Informant Lived Outside Standard Metropolitan Area	48	10
Personal Interview Not Completed	34	7
Personal Interview Completed, But Incomplete Lifetime Residence History Obtained	51	11

Table 1. Deceased persons excluded from tabulations: Deaths at ages 20 years and over in Pennsylvania Standard Metropolitan Areas, 1956.

in chronological order each prior place of residence where the deceased person had lived continuously for a period of at least one year. For each place of residence the following questions were asked:

A. What was his place of residence?
   a. Name of city, town, village, or rural place
   b. Name of county
   c. Name of state
B. Did he live inside the limits of this city, town, or village?
C. Did he live on a farm?
D. Did he live in (place entered in Aa) since birth?
E. When did he move to (place entered in Aa)?

There are certain limitations in the coverage of deaths in this study which may affect the reported findings. The findings are based on the residence histories of deaths allocated to nonfarm places in SMA's, which comprised about 80 per cent of the deaths in Pennsylvania during 1956. For various reasons (Table 1), residence histories were not completed or were incomplete for about 28 per cent of the sample deaths in SMA's and these were excluded from the tabulations.

The completeness of reporting of lifetime residence information varied according to the place of residence of the deceased person. (Table 2.) The proportion of reports covering the entire life was somewhat larger for decedents who lived in Philadelphia and Pittsburgh than for those who lived in places of

Period of Lifetime Covered	Total	Population Size of the Usual Place of Residence			
		1 Million or More	50,000–1,000,000	2,500–50,000 In SMA's	Rural Nonfarm In SMA's
Sample Size	400	130	92	94	84
Total (Per Cent)	100	100	100	100	100
Entire Life (Per Cent)	87	92	83	85	86
Not Entire Life	13	8	17	15	14
Less Than 20 Years	4	5	4	5	1
20 to 40 Years	5	2	8	5	7
40 Years or More	4	1	5	5	6

Table 2. Completeness of reporting lifetime residence history by population size of the usual place of residence: Deaths at ages 20 years and over in Pennsylvania Standard Metropolitan Areas, 1956.

smaller size. This apparent differential in the quality of residence history reports probably results from the fact that decedents who resided in Philadelphia and Pittsburgh were less migratory than were those residing in smaller places.

The results presented in this paper are based upon complete residence histories collected by personal interviews with family informants for 349 decedents who resided in SMA's. The residence history tabulations were appropriately weighted to adjust for differential sampling rates used in the selection of deaths from lung cancer and deaths attributed to other causes, and for differential subsampling rates used in the selection of cases for personal interviews.

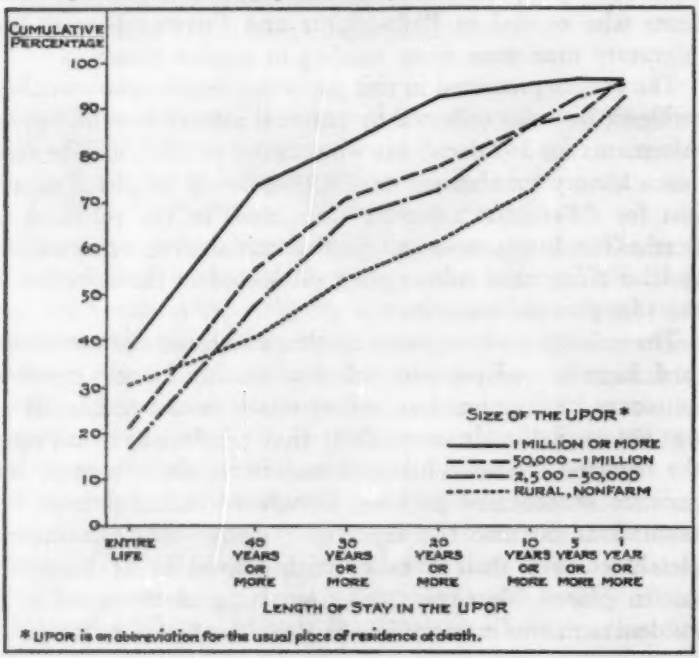
The validity of the reported residence histories was not evaluated because independent information from such criterion sources as birth or immigration records or census enumerations was not available. It seems likely that tabulations based upon the reported residence histories understate the migratory experience of deceased persons. Decedents excluded from the tabulations because the reported residence histories incompletely covered their lives invariably lived in at least two known places. Moreover, under-reporting of the number of residences due to memory bias is also a distinct possibility.

Findings

According to the lifetime residence history reports, 28 per cent of the decedents had lived their entire lives in the city, town, or rural place of their usual residence at death. The proportion who had lived in the usual place of residence at death, hereafter referred to as the UPOR, for a period of 40 years or longer was about 55 per cent. On the other hand, there was a substantial number of decedents who had resided in the UPOR for smaller periods of their lives. About 20 per cent had resided in the UPOR for periods of less than 20 years, and approximately 10 per cent had resided there for less than 5 years.

Almost two-fifths of the decedents whose UPOR was Philadelphia or Pittsburgh had lived their entire lives in these re-

Fig. 2. Cumulative percentage distribution of decedents by length of stay in, and size of the usual place of residence: Deaths at ages 20 years and over in Pennsylvania Standard Metropolitan Areas, 1956.



spective cities. By comparison, about one-fifth of the decedents living in urban places of less than one million population and about 30 per cent of those in rural nonfarm places in metropolitan areas had lived their entire lives in the UPOR.

There is an association between length of stay in the UPOR and population size of the UPOR. (Figure 2.) For decedents who did not live their entire lives in the UPOR, the length of stay in the UPOR appears to increase as the population size (based upon the 1950 Census) becomes larger. Virtually all decedents in Philadelphia and Pittsburgh had resided in their respective cities for at least 5 years. On the other hand, more than 15 per cent of those whose UPOR was in a rural nonfarm place had not lived in this place for 5 years. About 95 per cent of the decedents in the two largest cities, compared to about 60 per cent of those in rural nonfarm places, had lived in the UPOR for more than 20 years. Generally, the length of stay in an urban UPOR of less than 1 million population is about midway between that for resident deaths in rural nonfarm places and in the two largest metropolitan cities.

Length of stay in the UPOR varies both with the age and sex of the decedent. (Table 3.) The proportion of decedents who spent their entire lives in the UPOR is substantially smaller for older than for younger decedents, and this differential is more striking for females than for males. At ages below 65, there is no apparent sex differential in the length of

Table 3. Length of stay in the usual place of residence by age and sex of decedent: Deaths at ages 20 years and over in Pennsylvania Standard Metropolitan Areas, 1956.

Length of Stay In the Usual Place of Residence	Total	Age and Sex of Decedent					
		20 to 65 Years of Age			65 Years and Older		
		Total	Male	Female	Total	Male	Female
Sample Size	349	162	108	54	187	102	85
Total (Per Cent)	100	100	100	100	100	100	100
Entire Life	28	46	45	45	19	24	11
Not Entire Life	72	54	55	55	81	76	89
20 Years or More	50	33	32	34	59	62	59
Less Than 20 Years	22	21	23	21	22	14	30

Number of Places of Residence	Total	Size of the Usual Place of Residence			
		1 Million or More	50,000–1,000,000	2,500–50,000	Rural, Nonfarm
Sample Size	349	120	76	80	73
Total (Per Cent)	100	100	100	100	100
UPOR Only	28	39	22	17	31
UPOR and One Other Place	28	40	30	22	13
UPOR and Two Other Places	24	12	30	33	28
UPOR and Three or More Other Places	20	9	18	28	28

Table 4. Number of places of residence during lifetime by size of the usual place of residence: Deaths at ages 20 years and over in Pennsylvania Standard Metropolitan Areas, 1956.

stay in the UPOR, but at the older ages, the length of stay is of shorter duration for females than for males. For each age and sex grouping, the proportion who had lived in the UPOR their entire lives was greater for the resident deaths in the larger than in the smaller places.

It was noted earlier that about one-quarter of the decedents allocated to urban or rural nonfarm places in SMA's lived their entire lives in the UPOR. According to their lifetime residence histories, about one-quarter had lived in two places, and about the same fraction had lived in three places and in four or more places, respectively. (Table 4.) On the average, decedents lived in about 2.5 places during their lifetimes. Decedents in Philadelphia and Pittsburgh had lived in the fewest number of places.

On the average, decedents at ages 20 to 65 years had lived in slightly fewer than two places, compared with decedents at the older ages who resided in about 2.5 places during their lifetime. (Table 5.) At the younger ages, male decedents had lived in more places than female decedents, but at the older ages the reverse was true.

In many uses of mortality tabulations, the specific place to which the death is allocated is of secondary interest to its population size. For example, in studies of specific diseases, it is customary to examine mortality differentials with respect to

Number of Places of Residence	Total	Age and Sex of Decedent					
		20 to 65 Years of Age			65 Years and Older		
		Total	Male	Female	Total	Male	Female
Sample Size	349	162	108	54	187	102	85
Total (Per Cent)	100	100	100	100	100	100	100
UPOR Only	28	46	45	45	19	24	11
UPOR and One Other Place	28	17	12	26	33	38	32
UPOR and Two Other Places	24	22	20	23	26	23	29
UPOR and Three or More Other Places	20	15	23	6	22	15	28

Table 5. Number of places of residence during lifetime by age and sex of decedent: Deaths at ages 20 years and over in Pennsylvania Standard Metropolitan Areas, 1956.

the population size of the place of residence. From this viewpoint, it is pertinent to consider the duration of residence in places of the same population size as the UPOR, hereafter referred to as the length of stay in PUPOR.

For purposes of measuring the length of stay in PUPOR, each place of residence reported in the lifetime residence history was coded to one of ten population size classes according to the 1950 Census.[3] For places having the same assigned code as the UPOR, the years of residence were summed to obtain the number of years the deceased person lived in the PUPOR.

Based upon the population size groupings used in this analysis, about 35 per cent of the decedents had lived in PUPOR their entire lives. This is an increase of about 5 per cent over the proportion of decedents who had lived in UPOR their entire lives. In general, differences between the distribution of deceased persons by length of stay in UPOR and PUPOR are very small. The relationship noted earlier between length of stay in UPOR and size of UPOR holds also for length of residence in PUPOR and size of UPOR. (Figure 3.)

[3] The ten population size classes were: (1) 1 million or more, (2) 500,000–1 million, (3) 100,000–500,000, (4) 50,000–100,000, (5) 2,500–50,000, metropolitan county, (6) 2,500–50,000, non-metropolitan county, (7) rural, nonfarm, metropolitan county, (8) rural, nonfarm, non-metropolitan county, (9) rural farm, and (10) foreign.

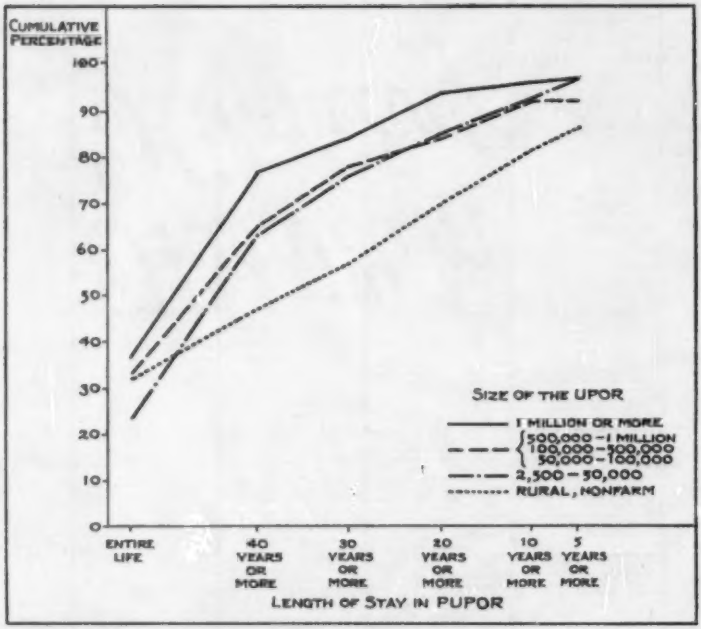


Fig. 3. Cumulative percentage distribution of decedents by length of stay in places of the population size of the usual place of residence: Deaths at ages 20 years and over in Pennsylvania Standard Metropolitan Areas, 1956.

In general, the age and sex differentials in length of stay in UPOR which were demonstrated earlier are consistent for the length of stay in PUPOR, although the gradients are somewhat smaller. (Table 6.) Older recedents lived in PUPOR for shorter periods than younger decedents, and at the older ages, females lived in PUPOR for shorter periods than males.

How much more descriptive of the lifetime residence history of deceased persons would the UPOR become if places of short-term residence (other than the UPOR) were excluded from consideration? This question is relevant because for some uses of lifetime residence history material, places of short-term residence may be of negligible interest. For example, in studies relating chronic disease mortality and environmental factors, such as air pollution, there would be relatively little concern

Length of Stay in Places of the Population Size of the Usual Place of Residence	Total	Age and Sex of Decedent					
		20 to 65 Years of Age			65 Years and Older		
		Total	Male	Female	Total	Male	Female
Sample Size	349	162	108	54	187	102	85
Total (Per Cent)	100	100	100	100	100	100	100
Entire Life	34	46	46	47	24	29	20
Not Entire Life	66	54	54	53	76	71	80
20 Years or More	51	38	37	39	60	61	59
Less Than 20 Years	15	16	17	14	16	10	21

Table 6. Length of stay in places of the population size of the usual place of residence by age and sex of decedent: Deaths at ages 20 years and over in Pennsylvania Standard Metropolitan Areas, 1956.

with the effects associated with residence places of short duration. With this thought in mind, the concept, "exposure places of residence" was developed. An exposure place of residence is defined as place(s) of the same population size in which the deceased lived for a period of at least 5 years during his lifetime. This concept is analogous to the concept of occupation exposure used in studies of differential occupation mortality. (1)

Grouping the places of residence reported for each decedent according to the 10 population size classes referred to earlier resulted in about two-fifth of the decedents being classified as having lived in only one exposure residence during their lifetimes. About two-fifths lived in two exposure places, and one-

Table 7. Number of exposure places by size of the usual place of residence: Deaths at ages 20 years and over in Pennsylvania Standard Metropolitan Areas, 1956.

Number of Exposure Places	Total	Size of the Usual Place of Residence			
		1 Million or More	50,000–1,000,000	2,500–50,000	Rural, Nonfarm
Sample Size	349	120	76	80	73
Total (Per Cent)	100	100	100	100	100
One Exposure Place*	38	46	33	27	42
Two Exposure Places	45	42	47	54	38
Three or More Exposure Places	17	12	20	19	20

* Includes decedents with no exposure places who constituted less than 1 per cent of the cases.

fifth lived in three or more exposure places. It is noteworthy that the population size of the UPOR was not an exposure place of residence for about 5 to 10 per cent of decedents. For each size of UPOR, more than 50 per cent of the decedents lived in two or more exposure places. (Table 7.) Decedents whose usual place of residence was Philadelphia or Pittsburgh lived in fewer exposure places than did other decedents.

About one-half the decedents under age 65 lived in more than one exposure place as compared to about 70 per cent of the older decedents. (Table 8.) It will be noted, particularly at the older ages, that females lived in more exposure places than males.

Discussion of Findings

Most of the decedents who were allocated on a *de jure* basis to nonfarm places in Standard Metropolitan Areas in Pennsylvania had lived there for substantial periods—more than 50 per cent had lived there for periods of 40 years or longer, and about 75 per cent had lived there for 20 years or longer. Tabulations of the usual place of residence are inadequate substitutes, however, for tabulations of lifetime residence histories. About three-fourths of the decedents had spent part of their lives in one or more places other than the usual place of residence at death. About two-thirds of the decedents had spent substantial pe-

Table 8. Number of exposure places by age and sex of decedent: Deaths at ages 20 years and over in Pennsylvania Standard Metropolitan Areas, 1956.

Number of Exposure Places	Total	Age and Sex of Decedent					
		20 to 65 Years of Age			65 Years and Older		
		Total	Male	Female	Total	Male	Female
Sample Size	349	162	108	54	187	102	85
Total (Per Cent)	100	100	100	100	100	100	100
One Exposure Place*	38	51	48	55	30	31	29
Two Exposure Places	45	36	41	30	50	54	47
Three or More Exposure Places	17	13	11	15	20	15	24

* Includes decedents with no exposure places who constituted less than 1 per cent of the cases.

riods of their lives in places of a different population size than the usual place of residence. Eliminating residences of the same population size in which the deceased person had resided for less than an exposure period of 5 years did not resolve the problem. Between 5 and 10 per cent of the deceased persons had not resided in places of the population size of the usual place of residence for an exposure period. About three-fifths of the decedents had lived in two or more different population size places for periods of 5 years or longer.

The adequacy of the usual place of residence at death for describing the lifetime residence history varied according to the population size of the usual place of residence. About two-fifths of the decedents in Philadelphia and Pittsburgh were lifetime residents of these two cities; in comparison, about one-fifth of the deceased persons in smaller size places had lived their entire lives in the UPOR. As would be expected from what is known about the growth of urban fringe areas, decedents in rural nonfarm places in Standard Metropolitan Areas had lived in the usual place of residence for the shortest periods of time—about 15 per cent of them having lived there for periods of less than 5 years. It is noteworthy that misstatements of residence information on the vital records and the resulting errors in place of residence allocation are most serious for these same urban fringe areas. (2)

The age factor itself offers a partial explanation for the finding that twice as many of the younger decedents had lived their entire lives in the usual place of residence than had older decedents. Immigration is another factor which helps to explain the age differential. About 20 to 25 per cent of the decedents at ages 65 and over were born in foreign countries, compared to about 10 to 15 per cent of the decedents at the younger ages.

Although sex differentials in the length of stay in the usual place of residence were negligible for decedents at ages 20 to 65 years, at the older ages the length of stay in the usual place of residence was substantially longer for males than for females. Since the average age at death for decedents 65 years and older

was greater for females, they had more years in which to migrate than had males. The sex difference in age at death resulted in a larger proportion of widows among the female decedents than widowers among the male decedents; widows and widowers, as compared to married and single persons, had shorter periods of stay in the usual place of residence. (Table 9.)

Marriage itself appears more likely to change the place of residence of females than of males. Thus, about 34 per cent of

Table 9. Length of stay in the usual place of residence by age, sex, and marital status of decedent: Deaths at ages 20 years and over in Pennsylvania Standard Metropolitan Areas, 1956.

Age, Sex, and Marital Status of Decedent	Sample Size	Total Per Cent	Length of Stay in the UPOR		
			Entire Life	20 Years Or More	Less Than 20 Years
20 Years and Older					
Male	210	100	32	50	18
Married	149	100	34	49	17
Single	20	100	51	31	18
Widowed	41	100	13	65	22
Female	139	100	21	52	27
Married	58	100	25	46	29
Single	20	100	48	33	19
Widowed	61	100	9	62	29
20 to 65 Years of Age					
Male	108	100	45	32	23
Married	85	100	41	35	24
Single	11	100	a	a	a
Widowed	12	100	a	a	a
Female	54	100	45	34	21
Married	33	100	34	38	28
Single	11	100	a	a	a
Widowed	10	100	a	a	a
65 Years or Older					
Male	102	100	24	62	14
Married	64	100	27	63	10
Single	9	100	a	a	a
Widowed	29	100	5	71	24
Female	85	100	11	59	30
Married	25	100	11	60	29
Single	9	100	a	a	a
Widowed	51	100	7	63	30

[a] The sample size was not large enough to warrant computation.

married males, as compared to 25 per cent of married females, had spent their entire lives in the UPOR. This sex differential was evident for both the younger and the older age groups, but was much more pronounced for decedents 65 years of age and older.

Summary and Conclusions

In vital statistics, deaths are allocated on a *de jure* basis according to the city, town, or rural place of residence of the deceased person as reported on the death certificate. Tabulations based upon this method of assignment are used for a wide variety of purposes. For some uses the adequacy of these tabulations depends upon how long the deceased person resided in the usual place of residence reported on the death certificate. Thus, it is important to evaluate residence data on the basis of how completely the usual place of residence reflects the residence history of the deceased person.

Lifetime residence histories for a sample of about 400 deaths, assigned on a *de jure* basis to nonfarm places in Standard Metropolitan Areas in Pennsylvania, were collected by means of a household survey of family informants identified on the death certificates. The survey demonstrated the feasibility of collecting lifetime residence histories of deceased persons. Although it seemed advisable in this report to confine the analysis to deaths for which information was collected by personal interviews, relaxation of the data specifications and improvements in self-enumeration techniques have made it possible to collect adequate residence histories by means of mail surveys of family informants. Thus, in a national lung cancer study adequate lifetime residence histories are being collected by mail query for about 80 per cent of the sample deaths.

Although approximately three-fourths of the decedents had resided in the usual place of residence for periods of 20 years or longer, only about one-fourth had resided there during their entire lives. Whether or not tabulations based upon these deaths would be adequate depends, of course, on the uses made

of them. Residence tabulations by population size were inadequate for purposes of defining the major population size places in which deceased persons had resided during their lifetimes. About three-fifths of the decedents had lived in more than one population size place for at least 5 years, and between 5 and 10 per cent of the decedents had resided in places of the same population size as the usual place of residence for less than 5 years.

It is possible to collect residence histories for a sample of the total population as well as for decedents, and to allocate the population and deaths on a common residence basis. This is currently being done in the national lung cancer survey mentioned earlier. In this collaborative study with the National Cancer Institute, the National Office of Vital Statistics is collecting data for a national sample of deaths and the Public Health Service has arranged for the Bureau of the Census to obtain similar data for the living population. By collecting residence history information from both sources, death rates may be computed in terms of types of lifetime residence patterns (e.g., entire life spent in one population size place or in combinations of two or more population size places).

At present, residence histories are not reported on the standard death certificate. Since it would be impractical to collect this information on the death record, a study based upon a sample of death certificates involving a small number of deaths would provide a more efficient method for collecting data needed for special purposes. On the other hand, it might be well to reconsider the desirability of adding an item concerning the length of stay in the usual place of residence at the next revision of the standard death certificate. This information is currently being reported on the death certificates in several registration areas. By including the item on the death record, it is possible to screen the deceased persons who resided in the usual place of residence for extremely short periods as well as those who resided there during their entire lives.

It was not within the scope of this report to evaluate national

tabulations of residence derived from *de jure* allocations of the place of residence at death. Whether or not differentials in the length of stay in the usual place of residence in terms of age, sex, and population size of place of residence as reported here apply to deaths other than those allocated to nonfarm places in Standard Metropolitan Areas in Pennsylvania during 1956 remains to be tested. The results, however, appear to indicate both the need for and the feasibility of conducting further studies of this type on a wider geographic basis.

More work is needed in developing methods for quantifying lifetime residence histories. Some methods for measuring lifetime residence history data as they relate to the usual place of residence were explored in this study. Quantification of lifetime residence histories in terms of a series of "residence moves" would appear to offer demographers unusual data for migration studies.

Glossary of Terms

1. *Lifetime Residence History:* The lifetime residence history of a deceased person included the usual place of residence at death and a chronological listing of each prior city, town, and rural place in which he lived continuously for one year or longer during his lifetime. It also included the length of stay in each place.

2. *Usual Place of Residence (UPOR):* The city, town, or rural place to which the death was allocated on a *de jure* basis according to the place of residence as reported on the death certificate defined the UPOR.

3. *Population Size of The Usual Place of Residence (PUPOR):* The number of years of residence that the deceased person lived in places coded to the same population size class as his UPOR was summed to obtain the number of years he lived in the PUPOR. Each place of residence reported in the lifetime residence history was assigned a population size class according to the 1950 Census as follows:

1 million or more
500,000–1 million
100,000–500,000

50,000–100,000
2,500–50,000, metropolitan county
2,500–50,000, non-metropolitan county
Rural, nonfarm, metropolitan county
Rural, nonfarm, non-metropolitan county
Rural, farm
Foreign

4. *Exposure Place of Residence:* An exposure place of residence is a place or a combination of places of residence in the same population size class (see above) in which the deceased person lived for at least five years.

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1. Buechley, R., Dunn, J. E., Linden, G., Breslow, L.: Death Certificate Statement of Occupation: Its Usefulness in Comparing Mortalities, *Public Health Reports*, November, 1956, Vol. 71, No. 11, pp. 1105–1111.

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ANOTHER LOOK AT THE INDIANAPOLIS FERTILITY DATA

DAVID GOLDBERG*

IN every study of urban differential fertility, measures of socioeconomic status have emerged as the primary determinant of fertility behavior. For the overwhelming majority of these studies the relationship between status variables and fertility has been inverse. Although some minor exceptions to the inverse fertility pattern have been observed, such as at the higher status levels, there have been only two instances in which the inverse relationship was conspicuously absent—Stockholm in the post World War I period[1] and a select group of "number and spacing planned" couples from the Indianapolis Study.[2] Clearly, the task of the analyst is to make use of socioeconomic differences in fertility as the base of any further inquiry into the matter. As Kiser and Whelpton have suggested, "The Indianapolis Study presents a challenge to learn the reasons for the overriding influence of socioeconomic status. There is good reason to believe that it is not socioeconomic status *per se* but rather the underlying attitudes and psychological characteristics of these classes that account for the fertility behavior."[3] Although the key to the puzzle need not necessarily be located among the psychological variables, describing differential fertility as it is related to status variables

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[1] Edin, K. and Hutchinson, E.: STUDIES OF DIFFERENTIAL FERTILITY IN SWEDEN. London, 1935.

[2] Kiser, C. and Whelpton, P.: Social and Psychological Factors Affecting Fertility: IX. Fertility Planning and Fertility Rates by Socioeconomic Status. *Milbank Memorial Fund Quarterly*. April, 1949, XXVII No. 2, pp. 188–244.

[3] Kiser, C. and Whelpton, P.: Resume of the Indianapolis Study of Social and Psychological Factors Affecting Fertility. *Population Studies*, 1953, VII, pp. 95–110.

certainly leaves us with a large interpretive gap between independent and dependent variables. Thus, the purpose of this paper is to specify the nature of the relationships between socioeconomic variables and fertility among couples who come from various types of social structures and to speculate about the interpretation or explanation of the relationships that emerge.

One of the problems in any study of urban fertility differentials results from the presence of rural elements in the population. A sample of almost any urban place in the United States will include at least a large minority of first or second generation farm migrants. About one-third of all adults living in nonfarm places in the United States are first generation farm migrants. Therefore, most studies of urban fertility differentials are far removed from describing the differentials that exist within the indigenous urban population.

It is entirely possible that the inverse fertility pattern so frequently reported to exist in urban areas results largely or entirely from the fertility behavior of the farm migrants rather than from the behavior of the indigenous urban population. In a study previously reported by the author, data from six probability samples of Metropolitan Detroit, covering the period 1952–1958, were used to test this proposition.[4] Respondents in that study consisted of married couples in which the wife was 40 or older. Younger couples were excluded because the relationship between socioeconomic variables and fertility has been subject to considerable change among the younger generations. Therefore, the study was geared to the cohorts in which the inverse pattern was most pronounced.

When the couples were classified by the occupation of the husbands' fathers in order to distinguish between the couples whose families had spent at least two generations in the urban setting and those who were first or second generation farm migrants, the following results were obtained:

1. Socioeconomic differences in completed family size among

[4] Goldberg, D.: The Fertility of Two Generation Urbanites. *Population Studies.* 1959, XII, pp. 214–222.

two generation urbanites were small and inconsistent. There was no distinct inverse or direct pattern.

2. Farm migrants exhibited a sharp inverse fertility pattern.

3. Farm migrants, on the average, had a larger number of children than two generation urbanites.

4. Farm migrants were disproportionately selected into the lower socioeconomic groups after their arrival in the urban area.

5. Findings 2, 3, and 4 produced the usual inverse fertility pattern for the total sample of metropolitan Detroit.

In general, the fertility differences observed among the "pure" urban types in Detroit were found to be statistically insignificant and small in the absolute sense. Since previous studies usually showed a pronounced inverse pattern, the Detroit data suggested that in the past we may have actually been looking at urban-rural differences when we were attempting to examine socioeconomic differences in fertility.

The suggestion that the inverse relationship between socioeconomic variables and fertility was confounded by a third variable, urban-rural background, has rather broad implications not only for fertility research but for general stratification research as well. One of the first questions to be raised before one begins to interpret the results is, would we get the same results in other urban places?

An opportunity to answer this question for another urban sample became possible when data from the Indianapolis Study were made available. Although the Indianapolis sample was restricted to couples who spent most of their married life in a large city, more than 38 per cent of the couples had some experience with farm life. In some respects the Indianapolis data provide a better test of the relationship observed in Detroit because there was more extensive coverage of the independent variables and the relationship between status variables and fertility could be observed with controls for the fertility planning status of the couples.

The 1,444 "relatively fecund" couples in the Indianapolis sample were classified according to the occupations of both the

husband's and wife's father. If both the husband's and wife's fathers had urban occupations, the couple had experienced an urban mode of life for at least two generations. The remaining couples were grouped into the categories "both parents farmers" and "one parent farmer." This classification could be carried out with 1,287 of the 1,444 fecund couples.[5]

Six indicators of socioeconomic status are used in the analysis—average annual earnings, net worth, husband's and wife's education, rent, and Chapin scale score. Table 1 shows the zero-order correlations between the status indicators and live births for each of the three farm-urban types constructed on the basis of the parents' occupations.

One difference between the data presented here and the data from the Detroit sample is the fact that the Indianapolis farm migrants (FF and FU) do not have a larger number of children than the two generation urbanites (UU). This finding probably results from a difference in the way eligible respondents were defined in the two studies. The Detroit sample included *any* farm migrant couples as long as the wife was 40 or older. This meant that the childbearing period could have taken place before or after migration to the urban environment. Eligible respondents in the Indianapolis Study were restricted to white Protestants who had spent most of their married life in a large city and had completed at least eight years of school. The educational restriction as well as the racial, religious, and residence restrictions eliminated the highest fertility group among the farm migrants to Indianapolis. A study done by Kiser in the 1930's with data from Syracuse and Columbus also showed that the fertility level of farm migrants who spent all of their married life in cities was no greater than the city born couples.[6]

[5] There were 860 "relatively fecund" couples actually interviewed at the time of the study. These 860 cases were inflated to 1,444 cases in order to yield a representative distribution by fertility. Of the 1,444 cases in the inflated sample, 157 had to be eliminated in this report because either the husband or wife did not report father's occupation.

[6] Kiser, C. V.: Birth Rates Among Rural Migrants in Cities. *Milbank Memorial Fund Quarterly*. October, 1938, XVI, No. 4, pp. 369–381.

If the average number of children among farm migrants is about equal to that of the urbanites, it does not necessarily follow that the differential fertility patterns of the migrants will be identical with or even similar to those of the urbanites. In Indianapolis we find that family size is the same for urbanites and couples with some farm background, but that within each of these groups there is a contrasting relationship between socioeconomic variables and fertility. The data collected in Detroit indicated a relatively strong inverse relationship between socioeconomic variables and fertility among the farm migrants and the absence of this relationship among the urbanites. It is clear from the data presented in Table 1 that the same situation existed in Indianapolis.

The contrast in the relationship between the status variables and fertility among the farm migrant couples and the two generation urbanites is most pronounced. Where both parents come from the farm setting (FF) each of the six status variables exhibits a relatively strong negative relationship to number of children. Among the pure urban types (UU) these relationships are very weak. In fact, the multiple correlation shown

Table 1. Correlations of socioeconomic variables with live births: Indianapolis study.

Socioeconomic Variables	All Couples			Excess Fertility Couples Eliminated			Number and Spacing Planned		
	FF[1]	FU[2]	UU[3]	FF	FU	UU	FF	FU	UU
2. Average Earnings	−.343	−.156	−.049	−.388	−.019	+.077	+.117	+.288	+.340
3. Net Worth	−.310	−.145	−.021	−.356	−.048	+.052	−.018	+.192	+.245
4. Husband's Education	−.314	−.149	−.116	−.218	−.006	+.010	−.158	+.145	+.276
5. Wife's Education	−.375	−.218	−.143	−.314	−.059	−.021	−.133	−.004	+.151
6. Rent	−.437	−.345	−.196	−.467	−.256	−.048	−.075	−.071	+.262
7. Chapin Scale	−.505	−.372	−.256	−.443	−.223	−.076	−.115	−.036	+.202
Average Number of Children	1.85	2.07	2.02	1.57	1.76	1.71	1.20	1.10	1.11
$R_{1.2345}$	.533	.406	.294	.491	.332	.174	.381	.412	.385
Number of Cases	115	378	794	87	280	584	35	99	229

[1] Both parents from farm.
[2] One set of parents from farm, other urban.
[3] Both parents urban.

in Table 1 indicates that the combined predictive power of the six status variables on fertility for the urbanites is less than the predictive power of any *one* of the six variables among the pure farm migrant types (FF). The combination of average earnings, net worth, husband's and wife's education account for only two per cent of the variance in fertility among the two generation urbanites. All six status variables account for less than nine per cent of the variance in their fertility. The negative relationship between the socioeconomic variables and fertility among the couples whose background is partially urban and partially farm (FU) may be described as moderate, located between the extremes in this relationship found among the pure urban and pure farm types.

When the excess fertility couples are eliminated from the analysis, the same type of pattern appears in an even more pronounced form. The pure farm types again exhibit a strong inverse pattern while for the urbanites there is no relationship between the status variables and fertility. For the latter group the correlations have the appearance of coming from a table of random numbers.

One of the most striking results to come out of the Indianapolis Study was the finding that within the "number and spacing planned" group there was a slight positive relationship between the status variables and size of family. If the results of this study are consistent with the direct relationship previously observed in the "number and spacing planned" group, it is to be expected that the pure urban types will display the strongest positive relationship between the status variables and fertility within this planning status category, whereas the farm migrants can be expected to lean toward a negative relationship. And this seems to be the pattern that is found in the data. There are 36 ordered comparisons that can be made between the correlation coefficients found among the farm-urban types for the three planning status categories used in this report. All of them are in the expected direction. Thus Indianapolis represents another instance in which the inverse pattern

for the total urban population results primarily from the fertility pattern of its farm migrants.

Now that these gross differences in the fertility patterns of farm migrant and urbanites have been shown, what does it mean? Why should couples coming from a farm background have smaller families the greater their economic success in the urban world while the indigenous urban population does not behave in this manner and may even have a tendency to behave in the opposite direction by having more children with greater success?

I shall not pretend to have an answer to this question, but the results merit a bit of speculation. Let us suggest that the differences in the fertility patterns of urbanites and farm migrants result from differences in the types of family structure that exist in these groups. First, I shall argue that the factors at work influencing family size decisions are different for husbands and wives. Secondly, I shall argue that among farm families, the family size decision is more likely to be made by the wife while among urban couples this decision is more likely to be shared. In combination these factors result in an inverse fertility pattern among farm migrant couples and the absence of this relationship among urban couples.

Some data have already been collected which suggest the possibility of there being distinctly different sets of conditions which influence men and women in their family size decisions. A recent study showed that for women, fertility norms and behavior seem to be directly related to the extent of their participation in the kinship network and home centered leisure whereas among males, status conditions are directly related to the number of children expected or desired.[7] High status frequently results in the wife being exposed to consumption patterns which shift the balance of roles away from home and family. Thus for any given status level husband and wife may have conflicting family size desires.

[7] Goldberg, D.: Family Role Structure and Fertility. Paper presented at the meeting of the Population Association of America, 1958.

Notice in Table 1 that the correlation between wife's education and number of children is always more negative or less positive than the comparable correlation between husband's education and number of children. To be somewhat more specific about this matter, on the basis of previous findings, it would be predicted that where husband and wife have a different amount of education, those cases in which the husband has more education than the wife will result in a larger family than in those cases where the wife has more education than the husband. Using data from the Indianapolis Study again, Table 2 gives the average number of children for six educational levels in which there are enough cases (at least 15) for a comparison to be made between situations in which husband has more education than wife or *vice versa*. For the total sample, five of the six comparisons are in the predicted direction and when the excess fertility couples are eliminated all six of the comparisons are in the expected direction. With the various fragments of evidence that are beginning to accumulate in this area we must begin to consider the obvious possibility that social status variables may not have the same effect on men and women with respect to their family size preferences.

If these differences exist, then it becomes important to know which marriage partner has the greater influence in the fertility decision if we are to understand something about the meaning

Table 2. Live births by educational level of husband and wife: Indianapolis study.

Educational Level	All Couples				Excess Fertility Couples Eliminated			
	Husb. > Wife		Wife > Husb.		Husb. > Wife		Wife > Husb.	
	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N
Grade, H.S.1–3	2.59	(95)	2.36	(160)	2.00	(61)	1.84	(104)
Grade, H.S. 4	2.26	(27)	1.93	(83)	2.04	(23)	1.61	(62)
H.S.1–3, H.S. 4	1.94	(72)	1.96	(109)	1.90	(48)	1.71	(80)
H.S.1–3, Col.1–3	1.78	(36)	1.29	(28)	1.65	(31)	1.31	(26)
H.S. 4, Col.1–3	1.72	(65)	1.41	(29)	1.48	(44)	1.16	(25)
Col.1–3, Col. 4	1.68	(57)	1.50	(18)	1.70	(46)	1.40	(15)

of the direction of the relationship between socioeconomic variables and family size.

The traditional family type has usually been associated with conditions in the rural setting. This type of family is described as one in which there exists a very sharp differentiation of sex roles. The performance of household and child-rearing functions is clearly the task of the wife. Most studies of urban and rural families have shown that city husbands are much more likely to participate in various household activities than are farm husbands.[8] In the urban community it would seem that the traditional sex roles are becoming increasingly more difficult to distinguish. In general terms we would probably argue that the family size decision, like other decisions, is usually the property of the person having the most extensive involvement in the particular area under consideration. Therefore, if farm wives perform a larger share of household and child-care functions than urban wives, it would follow that the farm wives may have greater influence in the fertility decision than urban wives. The participation of men in household activities has probably resulted in males having a greater influence in the traditionally feminine decisions as well.

On first reading, the suggestion that farm wives have greater influence in the decision concerning number of children than their urban counterparts may seem blasphemous if not ridiculous. The traditional family is considered patriarchal, the modern family, equalitarian. But as the family has shifted in power from patriarchal to equalitarian, it has also changed in structure, from a clear-cut division of sex roles to one in which these distinctions have become blurred. There is good reason to believe that where the functions of family members are sharply divided, power or influence is also divided. In the past, the family labeled as patriarchal could well have been one in which the husband had complete dominance in the economic sphere but had little to say or did not care about some other areas.

[8] For example, see: Blood, R.: The Division of Labor in City and Farm Families. *Marriage and Family Living*. 1958, xx, pp. 170–174.

In effect, the suggestion being made here is that the family has changed in two dimensions, power and division of labor and that any interpretation suggesting a unilateral shift in power within the family is grossly over-simplified. Indeed, the husband may have gained power in a number of areas as his role has changed through time. Which of the marital partners has the greater influence concerning family size in the so-called traditional and modern families remains as an empirical question.

It would be extremely difficult to ask couples to evaluate their relative influence in the fertility decision. Influence usually means the ability to implement desires in behavior. This suggests one way of operationalizing relative influence. There should be a strong correlation between desired number of children and actual number of children when influence is present and a weak correlation when influence is absent. Both husbands and wives were interviewed in the Indianapolis Study and each was asked about desired number of children.

If our assumption about family structure in the farm and urban families have been reasonably accurate up to this point, then we should expect to find that the correlation between live births and desired number of children is stronger for wives among the farm migrant couples where the inverse relationship is most pronounced. As the relationship shifts away from the inverse pattern toward the direct pattern, it should be expected that the husband has relatively more influence in the fertility

Table 3. Correlations of live births with husband's and wife's desired number of children: Indianapolis study.

	All Couples			Excess Fertility Couples Eliminated			Number and Spacing Planned		
	FF[1]	FU[2]	UU[3]	FF	FU	UU	FF	FU	UU
Wife's Desired No. of Children	+.513	+.329	+.270	+.338	+.405	+.312	+.567	+.399	+.171
Husband's Desired No. of Children	+.410	+.359	+.374	+.418	+.314	+.414	+.347	+.325	+.355

[1] Both parents from farm.
[2] One set of parents from farm, other urban.
[3] Both parents urban.

decision, indicated by his desired family size being more closely correlated with live births in the urban setting than in the farm setting.

Table 3 presents these data on influence. For the total sample and for the number and spacing planned couples, the correlation of live births with desires is stronger for the wives among the pure farm types (FF) and stronger for husbands among the two generation urbanites. This is as it should be if we are to make some sense out of the inverse relationship among farm migrants and the shift toward the direct relationship among the urbanites. However, the prediction breaks down in the group categorized as "excess fertility couples eliminated." Interestingly, the husband's influence remains relatively constant in all the farm-urban groups whereas the wife's power seems to decline between the pure farm and pure urban types. On the basis of greater husband participation in household activities among urban couples it might have been predicted that wife's influence would remain relatively stable or decline, while husband's influence would show an increase between farm and urban couples. Although these data do not conform precisely to our expectations, it does seem clear that husbands may have a greater influence in the fertility decision among urbanites.

The simultaneous operation of a negative relationship between status indicators and fertility for females and a positive relationship for males together with the tendency for the fertility decision to be primarily female in the rural setting and either shared or primarily male in the urban setting provides us with one possible interpretation of the data presented here. We need considerably more data before we can invest in this particular explanation rather than some alternative model.

Certainly, there are other interpretative schemes that can be used to account for the differences in the fertility patterns of urbanites and farm migrants. One such possibility would be a modification of the mobility hypothesis. For some time now, sociologists and demographers have argued that the inverse fertility pattern was a function of the differences between the

social classes in their adherence to the mobility ethic.[9] It has been suggested that the process of moving upward in the social hierarchy, whether desired or actual, is usually accompanied by a sacrifice in family values. Children use up the time, energy, and money that could otherwise be devoted to upward mobility. Thus, large families and mobility are incompatible with one another. Middle class persons are said to be more concerned with upward mobility than lower class persons. Therefore, we get an inverse fertility pattern.

In these data, an inverse fertility pattern is observed only among the farm migrants. As an explanation the mobility hypothesis would have to be modified to read that the significance of mobility is quite different from farm migrants and two generation urbanites. Actually, this is not an unreasonable assumption to make. Large cities are the centers of occupational mobility. Persons raised in these centers are equipped with many of the skills necessary to realize mobility opportunities. Some data have already demonstrated that persons reared in urban places have a distinct advantage over farm migrants in the mobility process.[10] This relative advantage also shows up in the Indianapolis materials. In data not shown here, it was found that urbanites are more likely to have non-manual occupations and enjoy a 15–20 per cent advantage in average earnings and net worth. The fact that urbanites hold higher socioeconomic positions in the Indianapolis sample is even more striking when it is considered that the farm migrants have achieved nearly the same level of education.[11]

If urbanites have a *de facto* advantage in mobility it could

[9] See: Westoff, C.: The Changing Focus of Differential Fertility Research: The Social Mobility Hypothesis. *Milbank Memorial Fund Quarterly*, January, 1953, XXXI, pp 24–38.

[10] A review of some of these data is given in: Lipset, S. and Bendix, R.: SOCIAL MOBILITY IN INDUSTRIAL SOCIETY. Berkeley and Los Angeles, 1959. Chapter VIII.

[11] Generally, there would be gross differences in the educational levels of farm and nonfarm reared persons in urban communities. However, the restrictions of Indianapolis sample forced a similarity in educational patterns. There is no difference in the proportion of persons who have completed high school among the farm migrants and two generation urbanites and only a slight difference in the average number of school years completed by the two groups, 10.8 and 11.2 years respectively.

be argued that the mobility expectations and orientations of urbanites are different from those of the farm migrants. It seems entirely possible that upward mobility is part of the expected life process for urbanites. Thus, the movement upward in the social system does not have to involve great discontinuities in lifeways and in particular, a sacrifice of family values. For the farm migrant, presumably beginning at a disadvantage, the mobility process may closely resemble the process as it has usually been described in the literature—a great struggle, involving sacrifice of almost all other values to the work-mobility ethic. Unpublished data from the Detroit Area Study, collected in 1955, indicate that the path to upward mobility is perceived differently by farm migrants and urbanites. A greater proportion of the urbanites expect to move up in the occupational hierarchy. Moreover, the urbanites feel that they have a greater probability of success in achieving their mobility desires. Among persons who want to move up occupationally, 69 per cent of the urbanites and 52 per cent of the farm migrants feel that they have a least a "fair" chance of realizing their mobility ambitions. This can be interpreted either as a difference in perception of the ability of the social system to accommodate desires or as a perceived difference in the extent to which the environment can be manipulated to one's advantage. Whichever interpretation one chooses, these data suggest that the achievement of mobility goals may involve fewer difficulties and adjustments (actual or perceived) for the urbanites.

Although a great deal of research has focused on mobility, the data have been inadequate for a full evaluation of the mobility hypothesis. One of the most glaring gaps in our knowledge involves the timing of relevant events. When do births occur relative to mobility? For those who achieve mobility early in the life cycle, the impact on fertility may be reduced considerably. Our knowledge of changes in the pattern of family activities that accompany the mobility process is also limited. We shall need data on changes in life style associated

with upward and downward movement before we can accurately describe the relationship between mobility and fertility.

In summary, I have tried to demonstrate that a relationship which was assumed to operate almost uniformly throughout the social structure does not, in fact, do so—that the inverse fertility pattern derived its existence from the behavior of farm migrants. As farm migrants become a smaller and smaller part of the urban population it is to be expected that the inverse relationship between socioeconomic variables and fertility will continue to contract. The meaning of this changing relationship is not at all clear. Two possible interpretations of the shifting fertility patterns have been presented. Neither of these interpretations can be fully substantiated on the basis of the data currently available. However, it does seem clear that the process of pursuing an explanation of fertility behavior will also yield a number of byproducts that may be of considerable importance in the fields of family structure and stratification.

CLASS FERTILITY DIFFERENTIALS IN ENGLAND AND WALES

DENNIS H. WRONG*

MORE detailed and comprehensive information on class fertility differences is available for Great Britain than for any other modern industrial society. Moreover, information on *trends* in class fertility, as distinct from data on differences at a single point in time, is also more complete for Great Britain than for other countries. Between them, the famous 1911 Census REPORT ON THE FERTILITY OF MARRIAGE and the more recent Family Census of 1946 conducted by the Royal Commission on Population, the results of which have been exhaustively analyzed by D. V. Glass and E. Grebenik, provide a record of the fertility experience of British women grouped by social class that covers a full century.[1] The earliest marriage cohorts in the 1911 REPORT consisted of women who had married in 1851 or earlier, while the latest cohorts covered by the 1946 census were women who had married a few years previously after the beginning of the wartime baby boom.

More recent data on class differences in fertility have been made available by the Census of England and Wales of 1951 which has released preliminary tabulations based on a one per cent sample of the total census population.[2] Glass and Grebenik made use of these data to compare post-1946 trends

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[1] Great Britain, Census Office, Census of England and Wales, 1911, Vol. 13, FERTILITY OF MARRIAGE, Part 2, London, H.M.S.O., 1923; Glass D. V. and Grebenik, E.: THE TREND AND PATTERN OF FERTILITY IN GREAT BRITIAN, Papers of the Royal Commission on Population, Vol. 6, Part I, London, H.M.S.O., 1954. The most thorough secondary analysis of the data on class fertility in the 1911 fertility census is John W. Innes, CLASS FERTILITY TRENDS IN ENGLAND AND WALES, 1876–1934, Princeton University Press, 1938, Chapters 2–3.

[2] Great Britain, General Register Office: CENSUS 1951. ONE PERCENT SAMPLE TABLES, Parts 1 and 2, London, H.M.S.O., 1953.

and patterns of class fertility with the trends and patterns shown by the youngest cohorts in the 1946 Family Census. Their use of them, however, is largely limited to this purpose and does not involve consideration of the 1951 data as a source of additional information on British class fertility differentials in their own right. The present paper essays this task to a modest degree.

The Data

Questions on numbers of children ever born were asked only of married women who were under 50 at the date of the Census, so the vast majority of the women in the sample had not yet completed their fertility. Cumulative fertility rates by social class were tabulated only for once-married women enumerated with their husbands, which tends, of course, to exaggerate the fertility of the sample as compared with that of the total population.

Fertility rates were tabulated by age at marriage and duration of marriage, both in quinquennial groups, with the exception of marriage durations under four years which were tabulated by single years. In contrast to the 1946 Family Census, rates were not tabulated by calendar year of marriage in addition to age at and duration of marriage. This omission and the fact that the age at marriage and duration of marriage distributions are tabulated only in quinquennial groups make it impossible to derive successive marriage cohorts subdivided by age at marriage from the data. Thus the fertility performance of successive cohorts cannot be compared, which greatly limits the value of the data for the purpose of analyzing trends.

The women were grouped into five social classes, modifications of the categories first devised by T. H. C. Stevenson in the 1911 fertility census which have been used in revised form by British Registrars-General ever since. The women were also divided into twelve socioeconomic groups.[3] Since the

[3] The twelve socioeconomic groups, listed and numbered roughly in accordance

(Continued on page 39)

class categories fail to separate nonmanual, nonagricultural manual, and agricultural occupations, which have in other countries proved to be the broadest occupational groupings differing markedly in fertility,[4] the rates for the twelve socioeconomic groups provide a valuable detailed picture of differential fertility. Charts 1 and 2 show cumulative fertility rates by social class and socioeconomic group respectively for women marrying at all ages in four marriage duration groups, and for women marrying at ages 25–29 in three duration groups.[5] Late-marrying women are excluded from the longer duration groups—durations of 10 years and over—because of the restriction of the Census to women who were under 50 at Census date. Accordingly, the fertility of the longer duration groups is overstated. The 25–29 age at marriage group has been selected for presentation because it is the "core" age at marriage group for Great Britain as a whole; the average age at marriage for women in Great Britain has fallen within this quinquennial range from 1926–30 to 1946–1949.[6] The rates for women of all ages at marriage by duration of marriage shown

with their socioeconomic status, are: 1. Higher Administrative, Professional and Managerial Occupations; 2. Intermediate Administrative, Professional and Managerial Occupations; 3. Shopkeepers and Small Employers; 4. Clerical Workers; 5. Shop Assistants; 6. Personal Service; 7. Foremen; 8. Skilled Workers; 9. Semi-Skilled Workers; 10. Unskilled Workers; 11. Farmers; 12. Agricultural Workers.

The occupational composition of these twelve groups is described in detail in Great Britain, Census 1951, One Percent Sample Tables, Part I, Table II.1, pp. 32–44. A thirteenth group, members of the armed forces, was excluded from the class categories and has been omitted from Figure 2.

The composition of the five social classes in terms of the twelve socioeconomic groups is as follows: Class I is identical with Group 1; Class II contains Groups 2, 3, and 11; Class III consists of Groups 4, 5, 6, 7, and 8; Class IV contains Group 9 and several Group 8 occupations as well; and Class V consists of Groups 10 and 12.

[4] Farmers are grouped with a number of other nonmanual occupations in Class II and agricultural workers with unskilled industrial workers in Class V. The problem of how to rank agricultural occupations in relation to nonagricultural, predominantly urban occupations is a perennial one faced by students of occupational stratification. In most modern countries agricultural occupations are quite distinct from the rest of the population with respect to fertility, but this is not the case in Britain where a smaller proportion of the population is engaged in agriculture than in any other contemporary country.

[5] Women who married at 25–29 and had been married for 25 years or more at the date of the census clearly fell outside the age limits of the sample.

[6] Hajnal, J.: The Marriage Boom. *Population Index*, April, 1953, 19, No. 2, p. 89.

in the Census tables were not standardized for age at marriage, although the percentage which each standardized and unstandardized rate made up of the rate for the standard population is shown, and confirms the persistence of the usual higher average age at marriage in the upper class groups.[7] The differences, however, are slight.

The rates shown for all durations of marriage for both the "all ages at marriage" and the 25–29 marriage group (the two top bar diagrams of Figures 1 and 2) include marriages of less than five years duration as well as the four longer duration groups shown in the other panels.

The earliest dates at which women in the 25–29 marriage age group had married are between 1927 and 1936, the calendar period of marriage for the 15–24 duration group. There were women still under 50 included in the Census who had married as long ago as the 1910–1920 decade, but only women who had married under 20 fall in this category and their rates are not shown separately; they are included, however, in the tabulations for women of all marriage ages and durations, and they comprise a large proportion of the women of all ages at marriage in the 25 years or more duration group (the bottom bar diagram of Figures 1 and 2). Thus the fertility experience of the total number of women in the Census sample covers roughly thirty-five years. The breakdowns by marriage duration provide material for an estimate of changing trends and patterns in class fertility differentials.

Trends and Patterns by Social Class

The bar diagrams below the top row in Figure 1 show class fertility differentials increasing with increasing marriage duration and also indicate a more marked and regular inverse relationship between fertility and class at the two longest durations. Greater lower-class stretching out of childbearing over the reproductive period clearly accounts to a large extent for these relationships between duration of marriage and the pat-

[7] Great Britain, General Register Office: Census 1951, Great Britain, One Percent Sample Tables, Part 2, Table x.9, pp. 278–283.

tern of differential fertility by class. Glass and Grebenik have shown, however, that in all classes there has been an increase in the proportion of total completed fertility which is achieved by the tenth year of marriage, although class differences in proportions achieved are still marked.[8] Thus the reversal of the traditional inverse fertility-class relation for the two top classes in the 10–14 duration group (Row 3, Figure 1) and for the three top classes in the 5–9 group (Row 2) may indicate a genuine trend towards narrowing differentials in completed fertility. The women in both of these duration groups married either just before or during the rising trend of the British birth rate that began in 1937 and thus were fully exposed to the baby boom. The break in the inverse relation at the top levels of the class system and the general contraction of fertility differentials suggest greater upper-class participation in the rise of the birth rate.

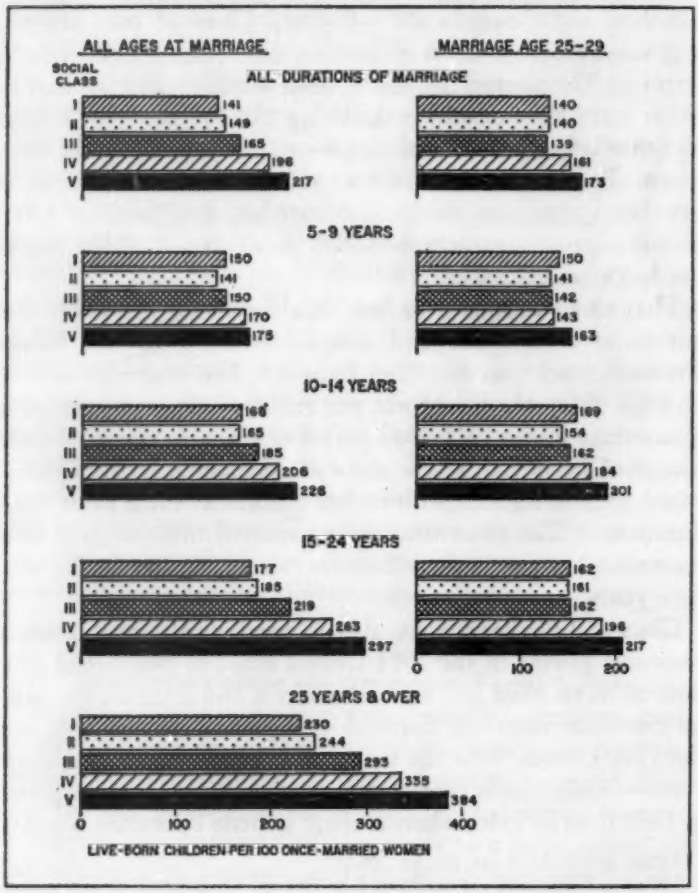
That this was indeed so has been shown for the two broad groups of nonmanual and manual workers by the Glass-Grebenik report on the 1946 Census.[9] The marriage cohorts of 1935–1944, which had not yet achieved ten years duration of marriage in the 1942–1945 period of rising fertility, revealed a marked narrowing of the nonmanual-manual fertility differential when compared with earlier cohorts at these same short durations.[10] The nonmanual group reacted more sharply than the manual group to the influences raising fertility in the wartime years.

Glass and Grebenik were able to combine the twelve socioeconomic groups in the 1951 Census into the two broad divisions of nonmanual and manual workers and compare the rates for the same marriage duration groups in both the 1946 and the 1951 Census.[11] At the longer durations—15–19 and 20–24 years—family size is consistently smaller for the manual group in 1951 than in 1946, whereas there is little difference between

[8] Glass and Grebenik, *op. cit.*, pp. 206–207.
[9] Glass and Grebenik, *op. cit.*, Table 5, p. 166, pp. 208–213.
[10] *Ibid.*
[11] *Ibid.*, pp. 244–245.

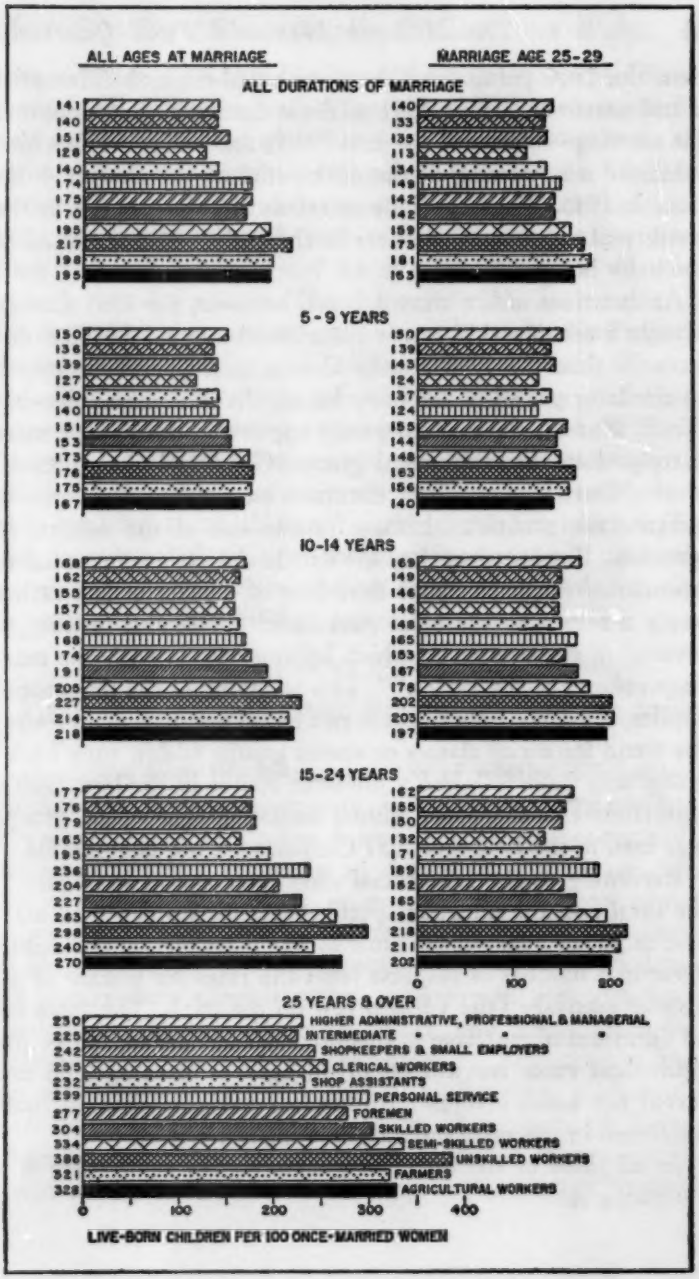
the two years for the nonmanual group. The 1951 long duration groups thus reflect the narrowing of the differential which took place in the 1930's.[12] At medium durations—5–9 and 10–14 years—the 1951 duration groups show higher fertility

Fig. 1. Class differences in numbers of children ever born by duration of marriage, per 100 once-married women, England and Wales, 1951.
Source: Great Britain, General Register Office: Census 1951, Great Britain, One Per Cent Sample Tables, Part 2, x.9, pp. 278–283.



[12] *Ibid.*, p. 213.

Fig. 2. Socioeconomic group differences in numbers of children ever born, England and Wales, 1951.



Source: Great Britain, General Register Office: Census 1951, Great Britain, One Per Cent Sample Tables, Part 2, x.9, pp. 278–283.

than the 1946 groups and the nonmanual-manual differential is still narrower. These 1951 medium duration groups contain the marriage cohorts of the late 1930's and early 1940's which exhibited a narrowing of the differential at the shorter durations in 1946. They continue to reflect the sharper rise in the fertility of nonmanual workers in the early wartime period of the baby boom.

At durations of less than 4 years, however, the 1951 Census reveals a considerably larger nonmanual-manual fertility differential than the 1946 Family Census at the same durations. In the later period of the baby boom, the five years following World War II, the manual group apparently responded more sharply than the nonmanual group. Glass and Grebenik observe: "Data for very short durations cannot be relied upon to indicate the probable ultimate family size of the cohorts in question. But for what they are worth, the ratios of manual to nonmanual fertility . . . for durations of 4 years or less rather imply a return to the older pattern of differential fertility, a reversal of the new trend which became visible with the marriage cohorts of the 1930's."[13] This widening of the differential applies, of course, only to these two broad occupational groups; the trend for social classes or status groups within each broad group may have followed a different course in the late 1940's. Unfortunately, the more refined socioeconomic status groupings used in the 1946 and 1951 Censuses are not comparable.

Returning to the 1951 social class rates shown in Figure 1, the total and the duration-specific rates for women who married at 25–29 (the vertical row of bar diagrams on the right) differ in a number of respects from the rates for women of all ages at marriage (the vertical row on the left). The rates for all durations of marriage in this marriage age group, unlike the equivalent rates for women of all ages at marriage, do not reveal the usual inverse fertility-class pattern: there is little difference in the rates for the three highest classes.

In all three of the duration groups on the right there is a

[13] *Ibid.*, p. 245.

virtual absence of any fertility differential between Classes I–III. In the 5–9 group, only Class V, unskilled workers, retains any excess of fertility over the other classes. Moreover, the highest class has become the second most fertile. Another striking feature of the duration-specific rates is that the fertility of Class I is actually higher in the 10–14 duration group than in the 15–24 group and the rate for Class III is the same in both duration groups. The sharpness of the increase in the fertility of the nonmanual groups in the early 1940's is reflected in these findings. Upper class wives clearly "moved up" their reproductive schedule to take advantage of the conditions favoring childbearing between 1942 and 1946. At longer durations the inverse pattern is likely to reassert itself, yet for these cohorts at least the inverse pattern may have been modified to an oblique J curve pattern in which family size decreases with rising socioeconomic status only up to the nonmanual groups of intermediate social status and then rises again to a slight but marked degree.

Trends and Patterns by Socioeconomic Groups

Figure 2 shows cumulative fertility rates for the twelve socioeconomic groups.

Deviation from the inverse pattern of relationship between fertility and socioeconomic status is far more evident when the five social classes are broken down into their component socioeconomic groups. At nearly all durations of marriage, both among women of all ages at marriage and among women marrying at 25–29, clerical workers (Group 4) are the group of lowest fertility. At most durations they are closely followed by intermediate administrative, professional, and managerial occupations (group 2), shopkeepers and small employers (Group 3), and shop assistants (Group 5). The group of highest socioeconomic status, higher administrative, professional, and managerial occupations (Group 1), exceeds all four of these nonmanual groups in fertility at all but the two longest marriage durations. From the longest to the shortest durations

among women of all ages at marriage and among women marrying at 25–29, the fertility rank of Group 1 increases, that of Groups 3 and 5 tends to decrease, and the relative positions of Groups 2 and 4 remain about the same.

Groups 1–5 contain the nonmanual middle-class occupations, and within this group the inverse fertility-socioeconomic status relation has all but disappeared, especially at durations of less than 25 years. At durations of less than 15 years the top-ranking nonmanual group exceeds the fertility of all of the others. Clerical workers are the most infertile group in British society with shopkeepers and small employers and shop assistants occupying second position; these three groups are the white-collar components of the Registrar-General's Class III (which also includes some manual occupations) and rank lowest in status of the nonmanual occupations.

At shorter durations Group 1 exceeds even the fertility of two manual groups: personal service (Group 6) and foremen (Group 7). These two groups, however, pose in all modern countries rather special problems of classification for both nonmanual or manual status and their socioeconomic rank.[14]

In the nonagricultural manual group fertility still tends to be inversely related to socioeconomic status. The only exception is the higher fertility of foremen as against skilled workers (Group 8) in the total sample (top row, left hand bar diagram), but examination of the duration-specific rates in the Census tables indicates that this is entirely the result of the higher fertility of foremen at durations of less than 5 years, which are not shown in the figure.[15] Unskilled workers (Group 10) are more fertile than either of the agricultural groups (Groups 11 and 12) at all marriage durations, as the marriage cohorts of completed fertility divided by occupational class in the 1946 Family Census also revealed.[16]

[14] Caplow, Theodore: The Sociology of Work. Minneapolis, University of Minnesota Press, 1955, p. 42.

[15] Great Britain, General Register Office. Census, 1951, Great Britain, One Percent Sample Tables, Part 2, Table x.8, pp. 264–271.

[16] Glass and Grebenik, *op. cit.*, p. 111.

Conclusion

The rise of fertility in the 1942–1950 period appears to have accelerated trends in socioeconomic fertility differentials which were underway when fertility was still declining in the 1930's. Yet the nonmanual-manual differential remains clear-cut and may have widened again at durations of less than 5 years. The smallest British families, however, are no longer to be found in the groups at the top of the socioeconomic status hierarchy, although they are still to be found among nonmanual middle-class occupations. Unfortunately, neither the 1946 Family Census nor the 1951 Census provide fertility data cross-tabulated with occupation and income. The low fertility of white-collar groups like clerical workers and shop assistants strongly suggest that it is the combination of low incomes with "bourgeois" styles of life characterizing these occupations which accounts for their low family size. The isolation of the income variable and the analysis of variations in fertility by income level within homogeneous occupational classes would greatly facilitate causal interpretation of group differences.

MEDICAL CARE PLANS AS A SOURCE OF MORBIDITY DATA

THE PREVALENCE OF ILLNESS AND ASSOCIATED VOLUME OF SERVICE[1]

PAUL M. DENSEN, EVE BALAMUTH, AND NEVA R. DEARDORFF[2]

ANYONE in the position of attempting to develop a program designed to maintain or improve the health of a population, or to evaluate such a program, has quickly become aware of the lack of quantitative morbidity data with which to assess the dimensions of the problem and to detect changes in these dimensions. The problem has become more troublesome as chronic illness has replaced acute illness as the major public health problem and as efforts to control the former have shifted the emphasis from mortality to the conditions of living. It is increasingly evident that sources other than mortality statistics need to be exploited to provide a picture of the health of a population.

There is a variety of such other sources, though not all of equal potential. A useful catalog of them may be found in the Report of the Subcommittee on National Morbidity Survey of the United States National Committee on Vital and Health Statistics (1). Although the report is primarily concerned with the household survey as a tool for gathering morbidity data

[1] This is the second report of a series based upon the records of the Health Insurance Plan of Greater New York. The first, an analysis of enrollment experience, appeared in The Milbank Memorial Fund *Quarterly*, January, 1958, XXXVI, No. 1. The study from which these analyses have been made was made possible by a grant of funds from the Commonwealth Fund and The Rockefeller Foundation to a Committee for the Special Research Project in H.I.P. The Committee has also published a report of a household morbidity survey of HIP and non-HIP families resident in New York. (HEALTH AND MEDICAL CARE IN NEW YORK CITY. Harvard University Press, 1957.) Besides the authors, the following members of the Committee were most closely associated with the longitudinal analyses of the records of the Plan: Dr. Lowell J. Reed, Chairman of the Steering Committee; the late Dr. Selwyn D. Collins; Jerome Cornfield; and Dr. Forrest E. Linder.

[2] Dr. Neva R. Deardorff died in August, 1958, before this manuscript was ready for publication. She had, throughout her tenure as Director of the Division of Research and Statistics at HIP, laid a firm groundwork for the study here reported and had specifically enlisted the aid of the Foundations above mentioned in order to process the HIP data for studies of morbidity experience.

on a national scale, there is discussion of the peculiar advantages and disadvantages of data derived from other sources, including those accumulated as a by-product of insurance and prepaid medical care plans.[3] It is the purpose of the present paper to present morbidity data derived from the records of one of these medical care plans—the Health Insurance Plan of Greater New York (HIP).

The Health Insurance Plan of Greater New York began operation as a non-profit corporation in March, 1947. It is generally classed as a "service" program, which means that in return for the premium the member is entitled to receive a variety of medical services. He receives no bills for these services, the premium paying the entire cost.[4] In this sense, once the premium is paid there are no additional costs for medical care in HIP. This contrasts with the "indemnity" type of program in which the enrollee is billed by the doctor and is indemnified in cash according to a fixed schedule of fees for those medical services covered in the contract. The indemnity received may or may not equal the amount of the physician's bill.[5]

The HIP contract makes available to the enrollee the following services in the home, physician's office, or hospital: general medical care; surgical, maternity, pediatric, and other specialist care; periodic health examinations; immunizations; laboratory and x-ray services; physical therapy; administration of blood and plasma; psychiatric consultations; visiting nurse services; and ambulance services.[6] There are no waiting periods

[3] It is pointed out that "only the broad coverage prepayment plans, of which the Health Insurance Plan of Greater New York and Permanente Health Plan are given as examples, do not suffer from (the) limitation . . . arising from the restrictions in the type of illness covered by the insurance and the termination of benefits under the plans after a certain number of weeks have elapsed or a certain number of dollars have been paid." Referring specifically to HIP it is also pointed out that "since the cost of the service has been removed as a determining factor, the utilization rates for persons covered by the plan will be of great value in determining what medical care is required for persons with specific conditions."

[4] The only exception to this is a possible $2.00 charge for a night call to the home between 10:00 p.m. and 7:00 a.m.

[5] *See* Anderson, O. W. and Feldman, J. J.: FAMILY MEDICAL COSTS AND VOLUNTARY HEALTH INSURANCE: A NATIONWIDE SURVEY. New York, McGraw-Hill, 1956 for a discussion of this point.

[6] Excluded are dental care, prescribed drugs and biologicals, prosthetic appliances,

(Continued on page 50)

for service and no limitations on number of services or duration of medical care. Group enrollment is required, and with few exceptions the employer pays at least half the premium directly or, in the case of union welfare funds, all of the premium is usually paid as a fringe benefit. A person losing coverage under the group contract is legally entitled to continue as an individual subscriber with a "policy in conversion."

Medical services are provided on a group-practice basis through medical groups distributed throughout New York City. The organization of these medical groups during the period of the present study is described in detail by Baehr (2). The medical groups are paid on a per capita basis for each individual on their rolls, irrespective of the volume of service. The payment of the individual doctor in the medical groups is determined by each medical group.

Potentially the records of health insurance programs are a very important source of morbidity data. In contrast to industrial sick-absence records limited to the worker himself they refer, in the majority of instances, to the worker and his dependents. They are not restricted to illness producing disability or absence from work although they reflect only that portion of illness for which medical care was sought. They are more nearly representative of the general population or at least of employed persons and their families than are Armed Forces data and, in contrast to household survey data, the basic information on morbidity is derived from physicians' reports rather than laymen.

So far as is known, there is only one morbidity study in the American literature presenting diagnostic data on an annual basis derived from the operating records of a medical care program. This is the report of Weissman on the experience of the Permanente Health Plan membership (3).

Reports on Canadian programs have been published by

purely cosmetic surgery; treatment for acute alcoholism, drug addiction, and mental or nervous disorders for which care, after diagnosis, by a psychiatrist is required; illness or injuries which can be treated only in an institution which is not a hospital for general care; anesthesia and certain other services, such as administration of blood plasma, if a hospital requires its administration by its own staff. Workmen's Compensation and Veterans' Administration cases are excluded.

Smiley et al (4) for the Windsor Medical Services, Inc. and by the Health Survey Committee to the Government of Saskatchewan (5) for the programs in that province. The data in the report on the Windsor Plan are confined to monthly prevalence rates and the Saskatchewan data pertain to recipients of social assistance and to the Swift Current Medical Care Program.

Morbidity data based on general practices in the British National Health Services have been presented for the period May 1955, to April 1956, by Logan and Cushion (6).

The scarcity of such studies in the United States may be ascribed to several factors: the relative newness in this country of prepaid medical care plans and their consequent natural preoccupation with administrative matters, and the high cost of developing such data. Because of these factors, many plans lack the population data necessary to the development of morbidity measurements.

This relative lack of concern with morbidity data on the part of medical care plans is changing. In addition to the growing needs of public health authorities for such data, the spread of the idea of health insurance and the experience of the plans themselves have given rise to an increasing number of questions whose solution depends upon knowledge of the extent and kinds of illness occurring in the insured population. Some examples follow of uses to which morbidity data have been put in HIP.[7]:

1. To provide quantitative data as a guide for administrative planning in the provision of medical care, e.g.:
   a. The prevalence of mental, psychoneurotic and personality disorders was used in connection with the possibility of providing coverage for treatment of some of these conditions by HIP.
   b. The prevalence of diseases producing disability commonly served by the Division of Vocational Rehabilitation of the New York City Health Department served as an indication of need for certain types of social service.

[7] The major headings under which the examples are classified are adapted from the report of the Subcommittee on National Morbidity Survey (1).

c. In connection with the possible opening of enrollment on an individual rather than group basis, a study was made of the possible effect of excluding from coverage persons having certain diagnoses.

d. The significance of the fact that half of all medical services rendered in HIP in a year are received by 12 per cent of the members of the Plan is being studied through examination of morbidity patterns of high and low utilizers of service.

2. To aid in the initiation and conduct of medical research, e.g.:

a. The volume of coronary disease to be expected in the population of certain medical groups interested in prognosis of the disease was estimated.

b. The number of cases required in test and control groups in clinical trials of certain anti-hypertensive drugs was determined.

3. To provide a basis for health education programs, for example, estimating whether the number of diabetics in the population of a medical group is sufficient to warrant special classes.

Thus the morbidity data available in HIP have been used to meet specific needs within the Plan. It is clear that other medical care organizations would have similar uses for data arising from their own operations. By the same token, each plan can learn from the experience of other plans. Moreover, from the broader medical and public health viewpoint the accumulated experience should result in the development of hypotheses relevant to the natural history and epidemiology of disease.

Source of Data and Method of Analysis

The morbidity data presented here consist of average annual "prevalence rates" for various diagnostic conditions for the period 1948–1951. Some data are also presented for the period from July 1, 1957 through June 30, 1958.

These data are derived from the basic reporting system of

HIP through which physicians furnish information on all services they render to HIP members. A physician service may be defined as a face to face contact between the doctor and the patient. Each such service is entered upon a form (the Med 10) provided for the purpose, one service per line (*see* Appendix A). In addition to information on diagnoses the form contains identifying data and the age and sex of the patient.

In order to develop the morbidity experience of HIP members from this reporting system it was necessary to bring together all the services rendered to a particular individual. This was done by punching a card for all physician services to a 10 per cent sample of persons insured in 1948, 1949, 1950 or 1951. The study population is presented in detail in Appendix E1 and E2. These "utilization" cards were then collated by identifying number, the services and diagnoses were listed in chronological order, the morbidity data were coded from the listing and finally, summary cards were punched from which the basic tabulations of this study were developed. In coding morbidity the 1948 edition of the International Statistical Classification of Diseases, Injuries, and Causes of Death was used. Table 1 gives the definition of diagnostic categories according to this edition, and Appendix B provides a detailed description of the methodology of processing the data.

Since the reliability of illness rates derived from the HIP operating program is dependent upon the completeness and accuracy with which services are reported, an effort was made to obtain some measure of this reliability. The detailed procedures are described in Appendix C. Briefly, the number of diagnoses and services reported on the Med 10's were compared with similar data obtained from the medical records of the physicians in the medical groups for 123 individuals who were covered for any period during the years 1948–1951. The two sets of observations were obtained and analyzed independently. It was found that the total number of services reported on the Med 10's was greater than that found on the clinical records. However, the two sources of data would generally yield preva-

Table 1. Average annual prevalence of specified diagnoses in the H.I.P. population for the period 1948–1951. Number of persons receiving one or more services related to specified category per 1,000 population per year.

I.S.C. Codes 1948 Revision	HIP Code	Diagnostic Category	Prevalence Per 1,000 Enrollees Per Year	
	1–2	Infective and Parasitic Diseases		38.0
001–019	1	Tuberculosis	1.6	
020–021, 027–080, 082–096, 100–130, 132–139	2	Other except Cardiovascular Syphilis and Syphilis of the C.N.S., Late Effects of Poliomyelitis, Dermatophytosis, "Virus" Infections with Respiratory or Gastro-Intestinal Manifestations or Unqualified	36.4	
	3–4	Neoplasms		29.1
140–205	3	Malignant Neoplasms	3.3	
210–229, 230–239	4,5	Benign and Unspecified Neoplasms	25.8	
	6–12	Allergic, Metabolic, Endocrine and Nutritional		95.9
240	6	Hay Fever	23.2	
241	7	Bronchial Asthma	11.4	
242–245	8	Other Allergic Disorders	14.7	
260	9	Diabetes Mellitus	6.1	
250–254, 270–277	10	Diseases of Other Endocrine Glands	8.0	
287	11	Obesity	26.8	
280–286, 288–289	12	Avitaminoses, Other Metabolic Diseases	5.7	
290–299	13–14	Diseases of Blood and Blood-Forming Organs		12.9
	15–17	Mental, Psychoneurotic and Personality Disorders		45.0
300–309	15	Psychoses	1.0	
310–318	16	Psychoneurotic Disorders	39.3	
320–326	17	Disorders of Character, Behavior, Intelligence	4.6	
	18–30	Diseases of Nervous System and Sense Organs		161.2
330–334	18	Vascular Lesions affecting the C.N.S.	1.1	
024–026, 345, 353, 356	19	Multiple Sclerosis, Lateral Sclerosis, Epilepsy, Syphilis of the C.N.S.	1.0	
340–344, 350–352, 355, 357	20	Other Diseases of C.N.S. except Migraine	0.9	
362, 363, 366	21	Brachial Neuritis, Sciatica, Neuritis or Neuralgia Other Than Facial or Trigeminal; Neuritis or Neuralgia NOS	13.8	
360–361, 364–365, 367–369	22	Facial or Trigeminal Neuralgia, Other Diseases of Cranial and Peripheral Nerves	1.7	
373–377, 381	23	Iritis, Keratitis, Uveitis, Inflammation of Optic Nerve or Retina, Corneal Ulcer	2.3	
370–372, 378–379	24	Conjunctivitis, Blepharitis, Hordeolum, Other Inflammatory Disease of the Eye	29.0	
380	25	Refractive Error	38.5	
385–387, 389	26	Cataract, Detachment of Retina, Glaucoma, Blindness	2.1	
382–384, 388	27	Other Diseases of Eye	14.8	
391	28	Otitis Media	30.0	
390, 392–396	29	Mastoiditis, Meniere's Disease, Other Diseases of Ear	22.1	
397–398	30	Deafness, Deaf-Mutism	3.9	

Table 1 (*Continued*)

I.S.C. Codes 1948 Revision	HIP Code	Diagnostic Category	Prevalence Per 1,000 Enrollees Per Year	
	31–45	Diseases of Circulatory System		81.9
400–402, 410–416	31	Rheumatic Fever and Rheumatic Heart Disease	3.9	
420–422, 451	32	Arteriosclerotic and Degenerative Heart Disease without Hypertension	7.5	
424*	33	Arteriosclerotic Heart Disease with Hypertension	2.1	
440–443	34	Hypertensive Heart Disease	2.6	
022–023, 430–432, 434	35	Other Heart Disease of Specified Etiology, Except Congenital, and Heart Disease Unspecified	1.1	
433	36	Functional Disease of Heart	1.2	
435*	37	"Possible Heart Disease" (Children)	1.4	
444–447	38	Hypertension without mention of Heart	20.3	
450, 452–456	39	Diseases of Arteries	3.0	
460, 462	40	Varicose Veins	7.7	
461	41	Hemorrhoids	15.9	
463–464	42	Phlebitis	1.6	
465–466	43	Pulmonary, Other Venous Embolism and Thrombosis	0.1	
467	44	Other Diseases of Circulatory System	3.2	
468	45	Disease of Lymph Nodes and Channels	10.3	
	46–52	Diseases of Respiratory System		421.8
470–475	46	Acute Upper Respiratory Infection	246.0	
481–483, 097–099*	47	Influenza, Grippe	72.9	
480, 490–493	48	Pneumonia	7.6	
500–501	49	Bronchitis, Acute and Unqualified	41.1	
510	50	Hypertrophy of Tonsils and Adenoids	14.5	
511–517	51	Chronic and Other Disease of Upper Respiratory System	35.0	
502, 518–527	52	Chronic Bronchitis; Other Dis. of Lung and Pleural Cavity	4.6	
	53–65	Diseases of Digestive System		107.9
530–535	53	Diseases of Teeth and Supporting Structures	5.1	
536–539	54	Other Diseases of Buccal Cavity and Esophagus	7.3	
540–542	55	Ulcer of Stomach or Duodenum	9.7	
543–545	56	Gastritis; Functional and Other Dis. of Stomach and Duodenum	22.0	
550–553	57	Appendicitis	3.2	
560–561	58	Hernia	7.5	
571	59	Gastroenteritis	24.0	
572	60	Ulcerative Colitis and Chronic Enteritis	1.1	
573	61	Functional Disorders of Intestines	12.0	
574–575	62	Anal Fissure or Fistula; Abscess Anus or Rectum	3.8	
570, 576–578	63	Other Diseases of Intestines and Peritoneum	3.5	
580–583, 587	64	Diseases of Liver and Pancreas	0.9	
584–586	65	Diseases of Gall Bladder	7.7	
	66–76	Diseases of Genitourinary System		80.1
590–594, 600–604	66	Nephritis and Nephrosis; Other Diseases of Kidney and Ureter	5.5	
605–609	67	Cystitis and Other Diseases of Bladder; Diseases of Urethra	8.5	

Table 1 (*Continued*)

I.S.C. Codes 1948 Revision	HIP Code	Diagnostic Category	Prevalence Per 1,000 Enrollees Per Year	
610–612	68	Diseases of Prostate	6.7	
613–617	69	Other Diseases of Male Genital Organs	5.8	
620–621	70	Diseases of Breast	3.9	
622–626	71	Diseases of Ovary, Fallopian Tube, Parametrium	2.3	
630	72	Infective Disease of Uterus, Vagina, and Vulva	13.2	
631–633	73	Other Diseases of Uterus	6.3	
634	74	Disorders of Menstruation	9.5	
635	75	Menopause	14.1	
636–637	76	Sterility; Other Dis. of Female Gen. Organs	4.3	
	77–81	Deliveries and Complications of Pregnancy		18.2
640–649	77	Complications of Pregnancy	3.2	
650–652	78	Abortion	2.1	
660	79	Deliveries without Complication	10.4	
661*, 670–679*	80	Deliveries with Complication	1.5	
680–689	81	Complications of the Puerperium	1.0	
	82–90	Diseases of Skin and Cellular Tissue		122.5
690–695, 698	82	Infections of Skin and Subcutaneous Tissue, except Warts and Molluscum Contagiosum	31.0	
696	83	Warts	9.6	
131	84	Dermatophytosis	11.2	
700–701	85	Seborrheic Dermatitis and Eczema	9.8	
702–704	86	Dermatitis	20.5	
705–707	87	Erythematous Conditions, Psoriasis, Lichen Planus	5.8	
708	88	Pruritus and Related Conditions	8.0	
714	89	Diseases of Sweat and Sebaceous Glands	13.1	
697, 709–713, 715–716	90	Hypertrophic and Atrophic Conditions of Skin; Other Dermatoses; Diseases of Nails and Hair; Other Skin Diseases	13.4	
	91–99	Diseases of Bones and Organs of Movement		112.3
722–723	91	Rheumatoid Arthritis; Osteoarthritis	7.9	
720–721, 724–725	92	Arthritis, Other and Unspecified	15.5	
726–727	93	Muscular Rheumatism, Rheumatism Unspecified	30.0	
735–736; N846–847	94	Disorders of Back	17.9	
730–734, 737–738	95	Other Diseases of Bone and Joint	4.5	
081; N805–845, N848, N922–929 specified old	96	Late Orthopedic Effects of Injury or Disease	1.6	
740–742	97	Bunions, Synovitis, Bursitis, Tenosynovitis	16.9	
743–744	98	Other Diseases of Muscle, Tendon, Fascia	1.3	
745–749	99	Other Diseases of Musculo-Skeletal System	16.6	
750–759	100	Congenital Malformations		4.3
760–766	101	Certain Diseases of Early Infancy		0.2
	102–109	Symptoms and Ill-Defined Conditions		65.4
		Symptoms referable to:		
780–782	102	Nervous System, Special Senses of Cardiovascular and Lymphatic Systems	9.8	
783	103	Respiratory System	7.5	
784–785	104	Gastrointestinal Tract or Abdomen	11.7	

Table 1 (*Continued*)

I.S.C. Codes 1948 Revision	HIP Code	Diagnostic Category	Prevalence Per 1,000 Enrollees Per Year	
786	105	Genitourinary Tract	3.7	
787	106	Limbs and Back	13.1	
790	107	Nervousness and Debility	6.6	
354, 791	108	Headache, Migraine	8.8	
788–789, 792, 794–795	109	Other Symptoms; Ill-Defined Disease	4.2	
	113–121	Accidental Injuries		99.7
N800–839	113	Fracture and Dislocation	11.9	
N840–845, N848	114	Sprains and Strains, except of Back	21.3	
N850–856	115	Head Injuries Other than Fracture	5.5	
N870–908	116	Laceration and Open Wound	18.3	
N910–929	117	Contusions and Superficial Injuries	26.6	
N930	118	Foreign Body in Eye	5.5	
N940–949	119	Burns	4.0	
N860–869, N931–936, N950–995	120	Other Specified Accidental Injury	3.0	
N996	121	Injury Unspecified	3.6	

* Additional I.S.C. code numbers adopted:

009 Arrested Pulmonary Tuberculosis
097 "Virus" Infection with Respiratory Manifestations
098 "Virus" Infection with Digestive Manifestations
099 "Virus" Infection, Not Otherwise Specified
424 Arteriosclerotic Heart Disease Accompanied by Hypertension
435 "Possible Heart Disease" (Children)
661 Delivery without Specified Complication in a Pregnancy Complicated by Other Significant Disease
679 Delivery without Complication Mentioned, but Stillbirth Noted

Modifications of I.S.C. code numbers:

420–422 As described in ISC, but only *in the absence of hypertension;* when hypertension is present, 424 is used
677 Changed to: Delivery with Other Complications
678 Changed to: Delivery by Caesarean Section, Not Covered by 670–677

lence rates of the same order of magnitude, with the possible exception of respiratory disease which tended to be higher when estimated from the Med 10's and symptomatic complaints, which tended to be lower than would have been obtained from the clinical records.

The Measure of Prevalence

Prevalence is defined in this study as the number of persons receiving one or more services from a physician for a particular medical condition in the course of a calendar year per 1,000 persons covered in the Plan. Thus defined, it is similar in concept to a "period prevalence rate" (7) (8) (9). However, it differs from the usual "period prevalence rate" in two ways: first, it refers only to those people who saw an HIP doctor dur-

ing the year and second, it is computed only for those people who have been in the Plan throughout the calendar year of study. Both these factors will tend to make the rate somewhat lower than the usually computed rate. The rate measures the extent to which members of the Plan sought medical care within the Plan for particular diagnostic conditions.[8]

Findings

The average annual frequency of various illness conditions over the period 1948–1951 for which any physician service was received is shown in Table 1.[9] The prevalence of broad classes of disease is shown in Figure 1. Diseases of the respiratory system outstrip all other broad categories; about two out of every five members of the Plan required some service for respiratory disease during the year. The ten broad categories of disease with highest prevalence are shown separately for the two sexes in Figure 1, and the detailed rates appear in Appendix F. Nine out of ten of these broad classes are common to the two sexes. Among the females, diseases of the genitourinary system, exclusive of deliveries and complications related to pregnancy, rank third in prevalence but this group does not appear among the top ten for males. Accidental injuries appear among the top ten in both sexes but are more prevalent in the male than the female.

Age Variation. Age specific rates for detailed diagnostic cate-

[8] *See* Appendix D for a detailed discussion of the meaning of the prevalence rate.

[9] The prevalence rates for the individual calendar years were examined to determine if there were any trends over the four-year period. For the most part, the crude rates were fairly constant from year to year. There were some apparent trends in the rates for infective, acute respiratory, digestive and skin diseases, for accidental injuries and for deliveries. With the exception of deliveries, these trends disappeared when the rates were adjusted to take account of changes in age composition of the population. The rising trend in the delivery rate remained even after these adjustments. These delivery rates are as follows:

	Deliveries per 1,000 women 15–44
1948	23.9
1949	42.9
1950	54.1
1951	65.0

The stability of the prevalence data over the four-year period for all diagnostic categories except deliveries allows combining of the data over the whole study period and computation of reasonably reliable age-sex specific prevalence rates.

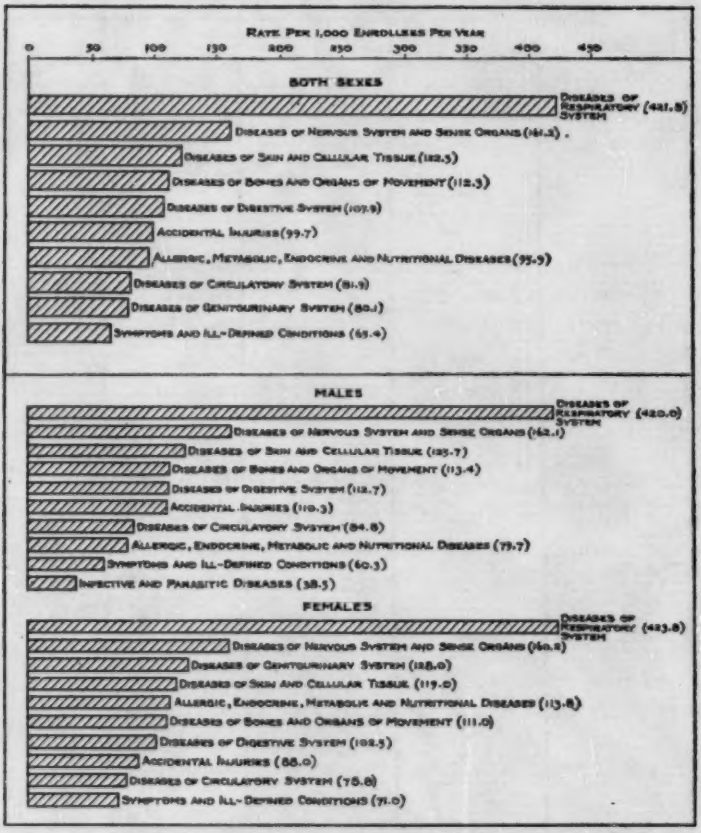

RATE PER 1,000 ENROLLEES PER YEAR
0
50
100
150
200
250
300
350
400
450
BOTH SEXES
DISEASES OF RESPIRATORY SYSTEM (421.8)
DISEASES OF NERVOUS SYSTEM AND SENSE ORGANS (161.2)
DISEASES OF SKIN AND CELLULAR TISSUE (122.5)
DISEASES OF BONES AND ORGANS OF MOVEMENT (112.3)
DISEASES OF DIGESTIVE SYSTEM (107.9)
ACCIDENTAL INJURIES (99.7)
ALLERGIC, METABOLIC, ENDOCRINE AND NUTRITIONAL DISEASES (95.9)
DISEASES OF CIRCULATORY SYSTEM (81.9)
DISEASES OF GENITOURINARY SYSTEM (80.1)
SYMPTOMS AND ILL-DEFINED CONDITIONS (61.4)
MALES
DISEASES OF RESPIRATORY SYSTEM (420.0)
DISEASES OF NERVOUS SYSTEM AND SENSE ORGANS (162.1)
DISEASES OF SKIN AND CELLULAR TISSUE (125.7)
DISEASES OF BONES AND ORGANS OF MOVEMENT (113.4)
DISEASES OF DIGESTIVE SYSTEM (112.7)
ACCIDENTAL INJURIES (110.3)
DISEASES OF CIRCULATORY SYSTEM (84.8)
ALLERGIC, ENDOCRINE, METABOLIC AND NUTRITIONAL DISEASES (79.7)
SYMPTOMS AND ILL-DEFINED CONDITIONS (60.3)
INFECTIVE AND PARASITIC DISEASES (58.5)
FEMALES
DISEASES OF RESPIRATORY SYSTEM (423.8)
DISEASES OF NERVOUS SYSTEM AND SENSE ORGANS (160.2)
DISEASES OF GENITOURINARY SYSTEM (128.0)
DISEASES OF SKIN AND CELLULAR TISSUE (119.0)
ALLERGIC, ENDOCRINE, METABOLIC AND NUTRITIONAL DISEASES (113.8)
DISEASES OF BONES AND ORGANS OF MOVEMENT (111.0)
DISEASES OF DIGESTIVE SYSTEM (102.5)
ACCIDENTAL INJURIES (88.0)
DISEASES OF CIRCULATORY SYSTEM (75.8)
SYMPTOMS AND ILL-DEFINED CONDITIONS (71.0)

Fig. 1. Annual prevalence of broad categories of disease in HIP enrollees. Ten highest categories based on average of the four calendar years 1948–1951 for both sexes combined and for males and females.

gories are shown in Appendix F. These are presented graphically in Figures 2–5 in such a way as to bring together conditions showing similar patterns of variation with age. It is felt that this form of presentation will help to bring together diseases somewhat similar in natural history. A similar approach has been used in the analyses of the Windsor Medical Services material (4).

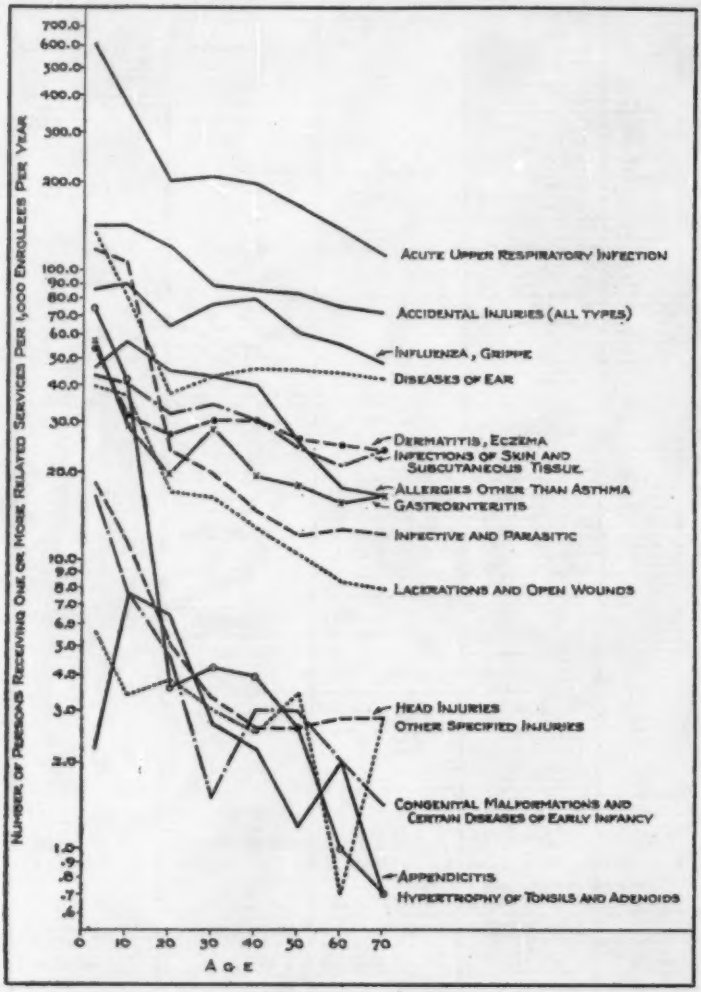


Fig. 2. Annual prevalence by age of conditions for which prevalence is highest in childhood and thereafter decreases or levels off.

A. Diseases in which Prevalence Declines with Age (*Figure 2*). Several reasons for the decline in these conditions may be suggested: there may be an acquired immunity, as with

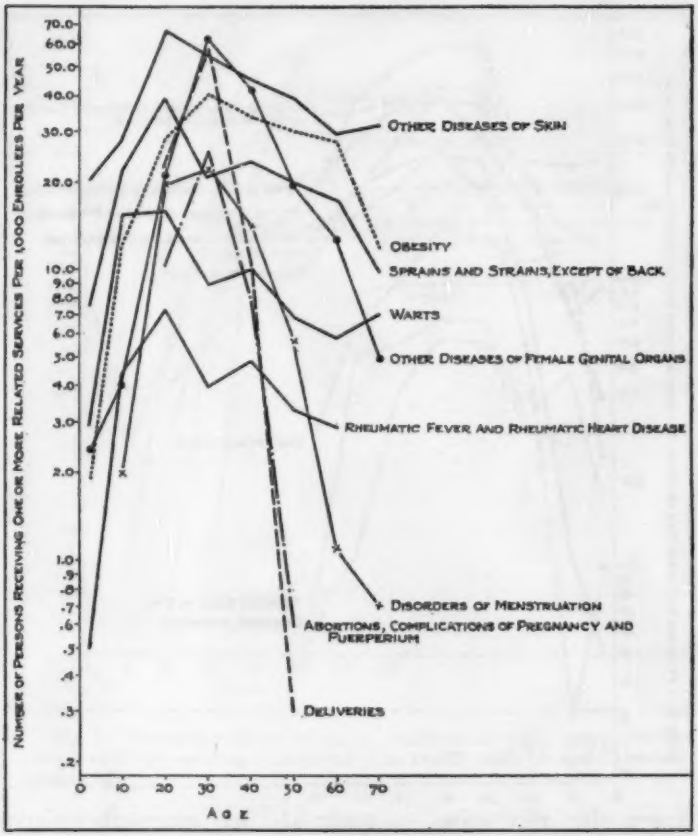


Fig. 3a. Annual prevalence by age of conditions for which prevalence increases with age, reaching a peak in early adult life and thereafter declining.

some of the infectious and parasitic diseases; an increased ability to cope, as in the case of allergies; environmental conditions may change, as with accidental injuries; there may be less importance attached to the condition with advancing age, as with acute upper respiratory infections and gastroenteritis. On the other hand, it is difficult to find specific explanations for the decline of appendicitis with age.

B. Diseases in which Prevalence Rises to a Peak and then

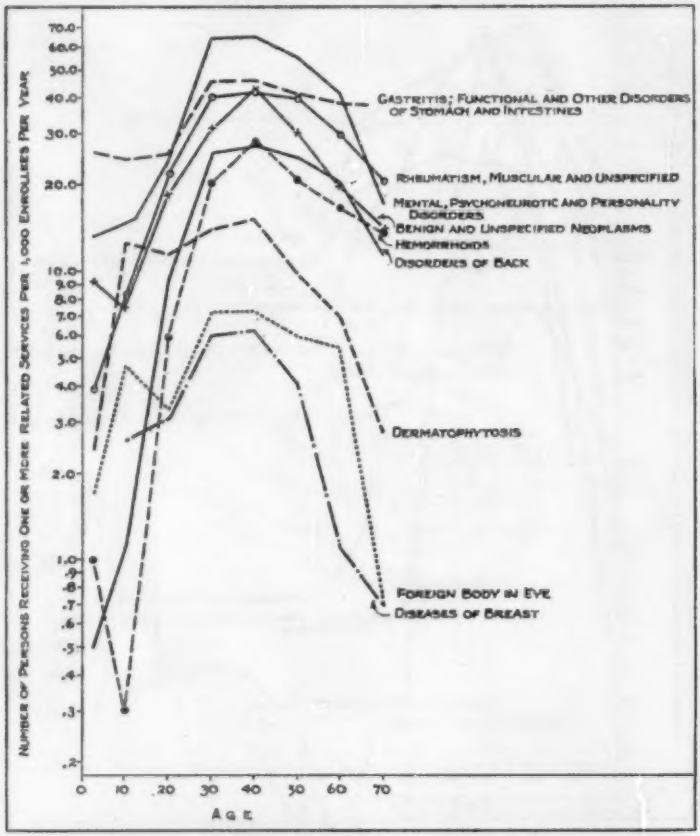


Fig. 3b. Annual prevalence by age of conditions for which prevalence increases with age, reaching a maximum in middle adult life and thereafter declining or leveling off.

Declines or Levels Off (*Figures 3a, 3b, 3c*). While for some of these conditions, such as diseases of the female genital system, the variation with age is readily understood, this form of graphic presentation brings out the fact that for many of the conditions shown the biological and environmental factors contributing to the observed variation are incompletely understood. Consider, for example, the mental, psychoneurotic, and per-

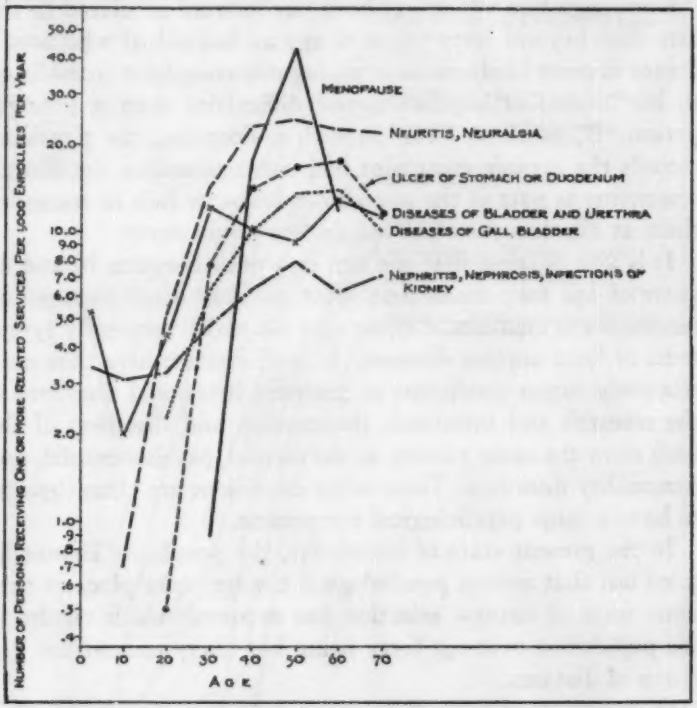


Fig. 3c. Annual prevalence by age of conditions for which prevalence increases with age, reaching a maximum after middle adult life and thereafter leveling off.

sonality disorders. In HIP these are overwhelmingly psychoneuroses, which constitute 87.6 per cent of the 2,714 person-years in which service related to mental illness was rendered. These reach a peak between 30 and 40 years of age and then decline. Others have remarked on this same pattern (10).

Speculation on the reasons for the declining prevalence of mental conditions with advancing age has been engaged in by many workers. It is worth examining the hypotheses which have been advanced for the suggestions they may contain on the information needed to throw light on the natural history of these conditions.

One suggestion which has been put forward is related to the fact that beyond forty years of age an individual who sees a doctor is more likely to have an organic complaint in addition to his mental or psychoneurotic difficulties than a younger person. If, as seems likely in such a situation, the physician records the organic complaint and either considers the mental symptoms as part of the overall syndrome or fails to recognize them at all, then the observed decline would occur.

It is also possible that the rise to a peak between 30 and 40 years of age may mean that what are considered as neurotic tendencies or neuroses at those ages are really very early symptoms of later organic diseases. It is of interest here that such relatively vague conditions as gastritis, functional disorders of the stomach and intestines, rheumatism and disorders of the back show the same pattern as the mental, psychoneurotic, and personality disorders. These other conditions are often thought to have a large psychological component.

In the present state of knowledge, the possibility cannot be ruled out that certain psychological changes take place or that some form of natural selection has occurred which results in the population over age forty being less likely to contract this group of diseases.

Of course, conditions of exposure may also change in such a way as to produce the observed pattern of prevalence with age. This may, in part, explain the rise and fall of dermatophytosis, foreign bodies in the eye, and some disorders of the back.

These speculations emphasize the need for investigations into the natural history of disease. The characteristics of prepaid medical care plans would seem to lend themselves well to such studies. Indeed, some efforts have already been made in that direction (11). However, much still needs to be learned about conducting research within the framework of such plans before their potential contribution can be fully realized.

C. Conditions for which Prevalence Increases with Increasing Age (*Figure 4*). The majority of these are the so-called "degenerative" conditions. The parallelism of the lines on the

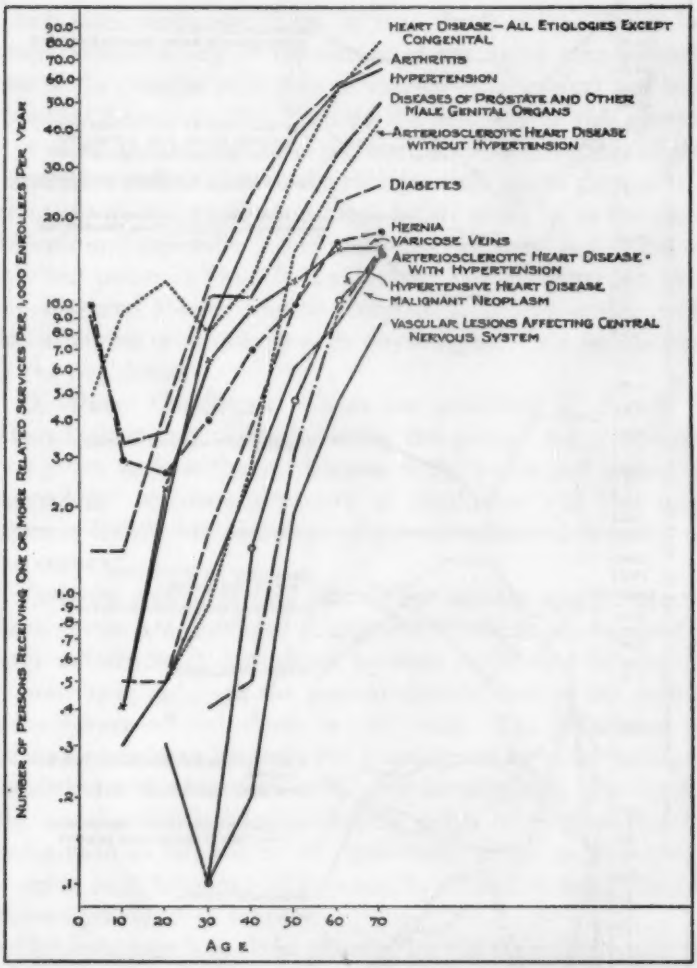


Fig. 4. Annual prevalence by age of conditions for which prevalence increases with increasing age.

semi-logarithmic scale brings out the fact that the rate of increase with age is strikingly similar for many of these conditions. From this one may speculate about a possible underlying similarity in the physiological and biochemical changes

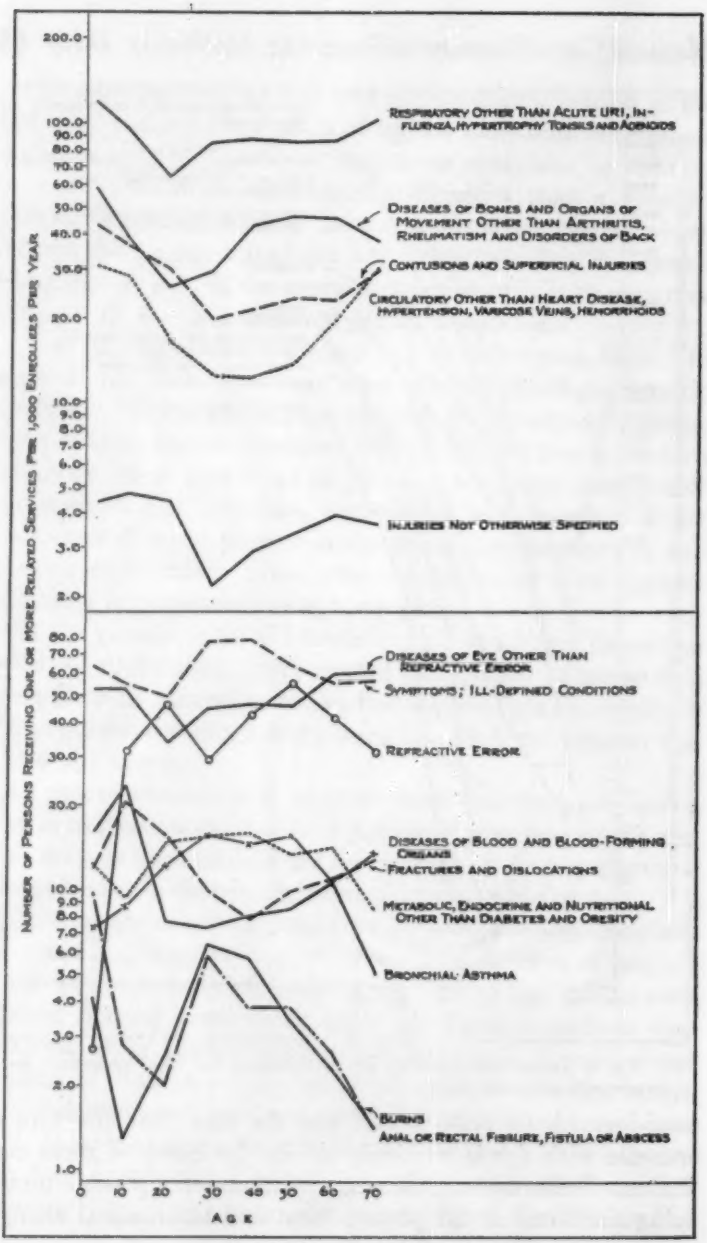


Fig. 5. Annual prevalence by age of conditions for which prevalence follows other patterns with age than those in Figs. 2, 3 and 4.

which occur with age. This, in turn, leads to the desire for more detailed study of the nature of the aging process itself and of the changes with time in various physiological and biochemical measurements. Perhaps the first step in this process is to develop such data on a representative cross-section of the population and to observe the changes with age in these measurements in the population groups before going on to the more difficult and expensive job of observing the same individual at different points in time. It is of interest in this connection that the National Health Survey Program is experimenting with the problems of obtaining such physiological data on samples of the population.

D. Other Conditions. These are presented in Figure 5. There is little to be said concerning this group. Many of these categories, such as "other diseases of the bones and organs of movement" embrace a variety of conditions and this may account for the bimodal type of pattern observed in many of the curves.

Variation with Age and Sex. When age-sex specific prevalence curves are examined (Appendix F) there are frequently large differences in prevalence between males and females at various ages, although the general classification of the prevalence curves offered above is still valid. The differences in relative prevalence between the sexes shown by these data are consistent with observations of other investigators. For example, arteriosclerotic heart disease is much more prevalent in males than in females at all ages—from three to almost six times as high, from age 35 on—and hypertensive heart disease is more prevalent in females.

Differences such as those afforded by the example, as well as others that may be derived from the data in Appendix F, emphasize the need for fuller understanding of the natural history of disease.

Comparison with Permanente Data

Mention has already been made of Weissman's report on

Table 2. Comparison of annual prevalence rates per 1,000 males and females, HIP 1948–1951, and Permanente Health Plan, 1949–1950[1,4].

Diagnostic Category[2]	I.S.C. Codes	Males			Females		
		HIP	Permanente		HIP	Permanente	
		Observed	Observed	Expected[3]	Observed	Observed	Expected[3]
Neoplasms, Malignant	140–205	4	4	3	3	4	2
Neoplasms, Benign and Unspecified	210–239	14	15	13	40	38	37
Allergic Disorders	240–245	50	53	54	48	49	49
Diabetes Mellitus	260	7	2	5	6	3	4
Obesity	287	13	16	13	42	47	40
Psychoneurotic Disorders	310–318	28	29	26	52	60	48
Inflammatory Diseases of the Eye	370–379	33	28	34	30	25	30
Other Diseases and Conditions of the Eye	380–389	52	46	48	59	58	56
Diseases of the Ear and Mastoid Process	390–398	60	64	66	51	55	55
Arteriosclerotic and Degen. Heart Disease	420–422	15	14	12	4	4	3
Hypertensive Disease	440–447	20	10	16	26	17	21
Varicose Veins	460	6	5	5	10	11	8
Hemorrhoids	461	18	12	16	14	16	13
Acute Upper Respiratory Infection	470–475	237	185	270	256	181	274
Influenza	480–483	73	30	75	73	24	74
Hypertrophy of Tonsils and Adenoids	510	16	25	22	13	21	15
Diseases of Stomach and Duodenum	540–545	38	32	35	25	18	24
Gastroenteritis and Non-Ulc. Colitis	571	24	21	27	24	23	26
Diseases of Liver, Gallbladder, Pancreas	580–587	6	3	5	12	8	10
Diseases of the Urinary System	590–609	12	8	11	16	22	16
Diseases of Male Genital Organs	610–617	24	22	22	—	—	—
Diseases of Female Genital Organs	620–637	—	—	—	112	122	107
Deliveries	...	—	—	—	25	41	32
Diseases of the Skin	690–716	113	121	116	110	110	113
Arthritis and Rheumatism	720–727	52	31	46	55	29	49
Other Diseases of Musculo-Skeletal System	740–749	35	29	36	35	29	34
Lacerations and Open Wounds	870–908	24	43	27	12	24	13
Superficial Injuries and Contusions	910–929	27	40	29	27	39	26
Burns	940–949	4	9	4	4	8	5

[1] *Definition of prevalence rates:*
HIP: Number of persons receiving one or more services related to the specified diagnosis per 1,000 enrollees per year. Rates are based on average of the four calendar years 1948–1951 for a 10 per cent sample of all enrollees with 12 months of coverage in any of these calendar years: 60,302 person-years.
Permanente: number of cases per 1,000 persons who were Health Plan members for the full year May 1, 1949–April 30, 1950. A case is defined as "the illness . . . chiefly responsible for the patient's seeking medical attention." Rates are based on 10 per cent sample of the enrollment during the study year: 6,667 person-years.

[2] Diagnostic categories selected for comparison are all those in which it was possible to obtain age-sex specific rates from the HIP data which corresponded to the groupings published in the Permanente report.

[3] Expected prevalence rates were computed by applying the age-sex specific rates from the HIP 1948–1951 data to the Permanente study population.

[4] Weissman, Arthur: A Morbidity Study of the Permanente Health Plan Population; a Preliminary Report. Permanente Foundation *Medical Bulletin*, January, 1951, IX, No. 1.

morbidity in the Permanente Health Plan of California (3). Table 2 presents comparative data for HIP and Permanente. There is a remarkable degree of correspondence in the general order of magnitude of many of the rates as, for example, for neoplasms, allergic and metabolic disorders, psychoneurotic disorders, diseases of the eye, arterioclerotic and degenerative heart diesase, diseases of the gastro-intestinal tract, of the genitourinary system and of the skin.

On the other hand, rather wide differences are observed for the respiratory conditions, arthritis, hypertension and, possibly, for diabetes, with HIP having the higher rate for all these categories. The delivery rate in HIP is lower than that of Permanente.

Comparisons of this type reinforce the idea that much valuable material on the morbidity status of population groups covered by health insurance plans lies in the records of these plans. Since the proportion of the population covered in one or another of various kinds of health insurance plans is increasing rapidly, one may at least entertain the idea that in time systematic sampling of such records may help to provide a picture of the health status of the population. Furthermore, the data from such records can help to evaluate the morbidity picture derived from household survey data such as those collected in the National Health Survey Program. And, not the least of the advantages to be derived from systematic comparison of such data are the possibilities for epidemiologic study which may exist in such variations as that of the prevalence rates for respiratory diseases. Why does the HIP rate differ so greatly from that of Permanente? The systematic exploration of such observed variations should enhance our understanding of the epidemiology of these diseases.

Comparison with 1957–1958 Data

In 1958 a study being carried out for the National Health Survey Program provided the opportunity to compare, in a general way, the HIP prevalence rates of 1948–1951 with those

Diagnostic Category	1948–1951 Observed Prevalence	1957–1958	
		Observed Prevalence	Expected Prevalence[2]
Benign and Unspecified Neoplasms	25.8	20.9	24.4
Hay Fever	23.2	26.0	23.8
Allergies Other than Asthma or Hay Fever	14.7	18.9	16.0
Obesity	26.8	25.4	25.6
Mental, Psychoneurotic, Personality Disorders	45.0	43.1	42.0
Heart Disease	19.9	24.7	15.5
Hypertension without Heart Disease	20.3	17.9	18.3
Chronic Respiratory Diseases other than Hypertrophy of Tonsils and Adenoids	39.6	34.6	38.1
Other Diseases of Female Genital Organs (Excluding Diseases of Breast, Disorders of Menstruation and Menopause)	26.1	22.5	24.7
Diseases of Skin and Cellular Tissue other than Infections	91.5	74.4	91.4
Arthritis	23.4	17.2	21.4
Rheumatism	30.0	17.4	27.5
Disorders of Back	17.9	20.1	16.2
Other Diseases of Bones and Organs of Movement	40.9	44.2	40.9

[1] The 1957–1958 data are derived from 6,609 person-years of experience contributed by a stratified sample of HIP enrollees interviewed by the National Health Survey in May or June of 1958. Observed prevalence rates, 1957–1958, are derived from physician services reported on the Med 10's in the calendar year preceding date of interview.

Categories of disease here selected for comparison are those in which more than 100 cases were obtained in the 1957–1958 data.

[2] The expected prevalence rates were computed by applying the age-sex specific prevalence rates obtained from the 1948–1951 data to the population interviewed in 1958.

Table 3. Prevalence of selected categories of disease in HIP enrollees, 1948–1951 and 1957–1958.[1] Number of persons receiving one or more services related to the specified category per 1,000 enrollees per year.

obtained for the year mid-1957 to mid-1958. This comparison is shown in Table 3 and is limited to those conditions in which there were more than 100 cases in the later study.[10] The comparisons are in terms of observed and expected rates in 1957–1958, in order to take account of the fact that the population for the later period is younger and contains a somewhat higher proportion of females than was the case in 1948–1951.

On the whole, one is more impressed by the similarity of the rates than by the differences. In most cases the magnitude of the difference is small in an absolute sense. (No statistical tests of significance have been made). However, there appear to have been sizable decreases in prevalence of diseases of the skin and of rheumatism. On the other hand, there has been

[10] The 1957–1958 data are based on a much smaller sample (6,609 person-years) than the earlier study (60,302 person-years).

an increase in the prevalence of heart disease over this period. Though these data need further exploration, they do illustrate the potential value of morbidity data collected from time to time in a medical care plan.

Volume of Service Related to Specific Diagnoses

Assessment of the importance of various disease entities in the health fabric of the community may be approached from many different standpoints. Prevalence, just discussed, is one criterion; incidence is another. A third is the days of disability associated with a given condition. Still another is the volume of medical care which is used by persons having a particular condition. The records of medical care plans are particularly suited to the development of this last measure.

The volume of service associated with particular diagnoses is of particular interest to those concerned with the development of methods for prepaying medical care and with administrative mechanisms for providing such care. It bears on such questions as the effect on overall utilization, and hence on premium rates, of excluding persons with certain diagnostic entities from coverage. It has significance for the comparison of benefits received under programs of varying degrees of comprehensiveness. It has pertinence in regard to questions of staffing and physical facilities required for providing certain services.

The Percentage of Total Services Accounted For by Particular Disease Entities

Respiratory diseases are not only the most prevalent disease category but they also account for nearly 21 per cent of all physician services to the males and nearly 19 per cent to the females. (Figure 6). The allergic, metabolic, endocrine, and nutritional disorders, while ranking sixth among the top ten in prevalence, rank second in percentage of total service, accounting for about 13 per cent of the total.

Diseases of the genitourinary system account for a much

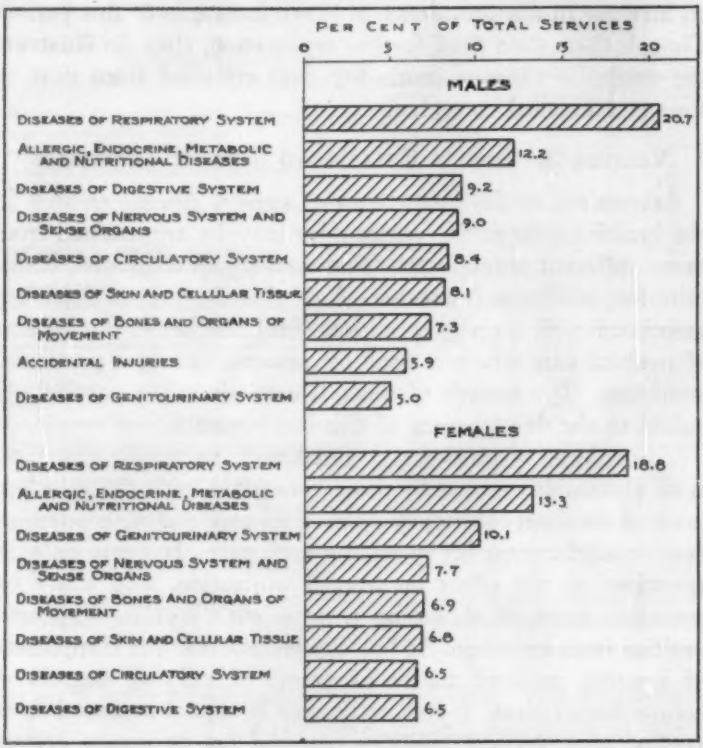


Fig. 6. Percentage of total services related to broad categories of disease, by sex.

higher proportion of total services to the females than to the males, even after services related to pregnancy are excluded. On the other hand, "accidents" as a class account for a larger proportion of total services to males than to females.

The variation by age and sex in the relative contribution of each disease category to the total volume of physicians' services is shown in Figure 7 and Appendix G. The respiratory diseases account for nearly 40 per cent of all physician services in children under 15 years but the percentage declines rapidly with advancing age, and levels off at a little more than 10 per cent in the old age group.

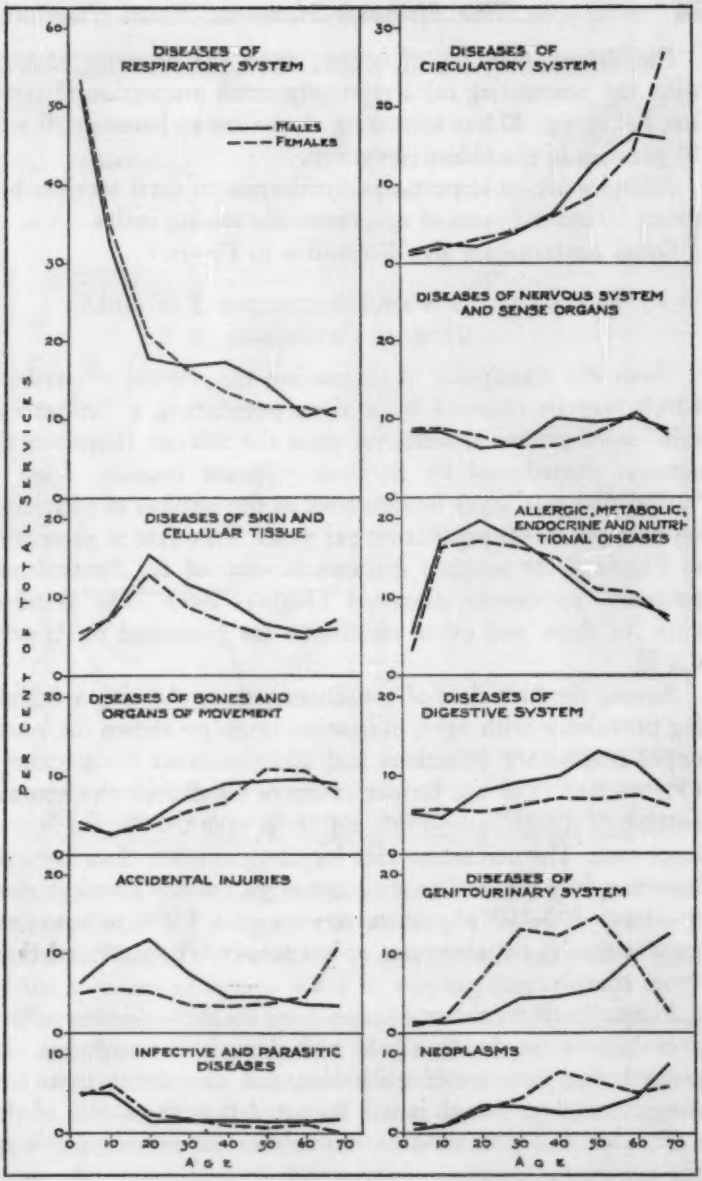


Fig. 7. Percentage of total services related to broad categories of disease, by age and sex.

Circulatory diseases, of course, show the opposite pattern with age, accounting for a relatively small proportion of services before age 40 but increasing thereafter to between 20 and 30 per cent in the oldest age group.

Allergies are an important contribution to total services between 10 and 30 years of age, especially among males.

Other patterns are also discernible in Figure 7.

The Utilization of Services for Particular Disease Categories

From the standpoint of estimating the volume of services which may be required by a given population, a "utilization rate" is of greater significance than the relative frequency of services contributed by particular disease entities. Such a "utilization rate" may be expressed as the number of physician services per 1,000 population per year. This rate is presented in Figure 8 for selected diseases in each of the "prevalence patterns" previously discussed (Figures 2–5). The detailed data for these and other conditions are presented in Appendix H.

Among the first class of conditions—those showing a declining prevalence with age—utilization rates are shown for acute upper respiratory infections and allergies other than asthma (Figure 8a). For the former group of conditions the general pattern of the utilization rate conforms with that of the prevalence rate. The utilization rate for allergies other than asthma, however, does not decline with age as prevalence does but rises to about 300–350 physician services per 1,000 persons per year at age 10, remains more or less steady till age 40 and then drops sharply.

Figure 8b shows the utilization rates for three diseases whose prevalence rates rise to a peak and then decline with age. In general, the patterns of utilization and prevalence rates are roughly similar, though it will be noted that the slopes of the utilization and prevalence curves differ for some periods of the age span.

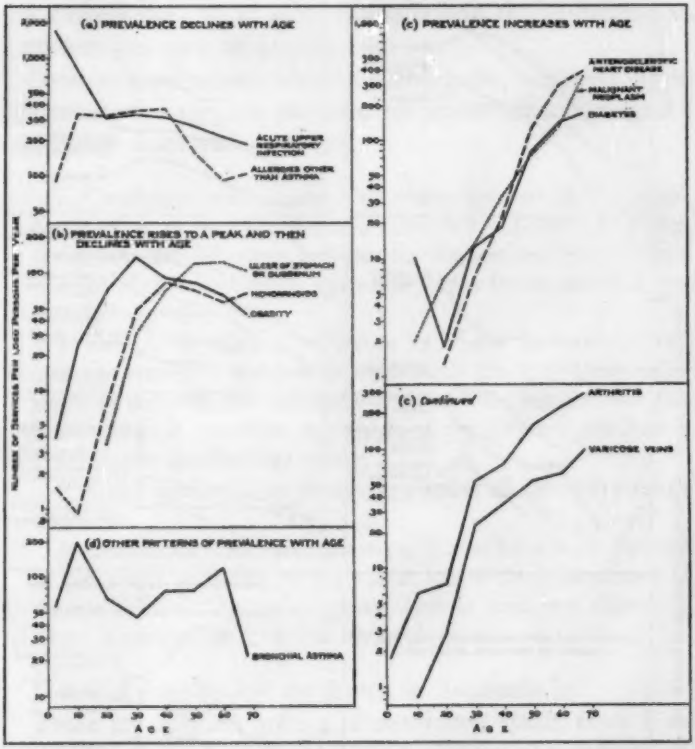


Fig. 8. Number of physician services per year per 1,000 population of specific age for selected diseases for which age patterns of prevalence differ.

In general, the utilization rates for the third group of conditions, those with rising prevalence rates (Figure 8c) conform to the pattern of the prevalence rates, though again the slopes of the two sets of curves differ in varying degrees.

The utilization curve for bronchial asthma (Figure 8d) has the same general shape as that of the prevalence curve.

The fact that the slopes of the utilization and prevalence curves are not the same at all points of the age scale means that the number of *services per patient* must vary with age. From the standpoint of the practicing physician the services

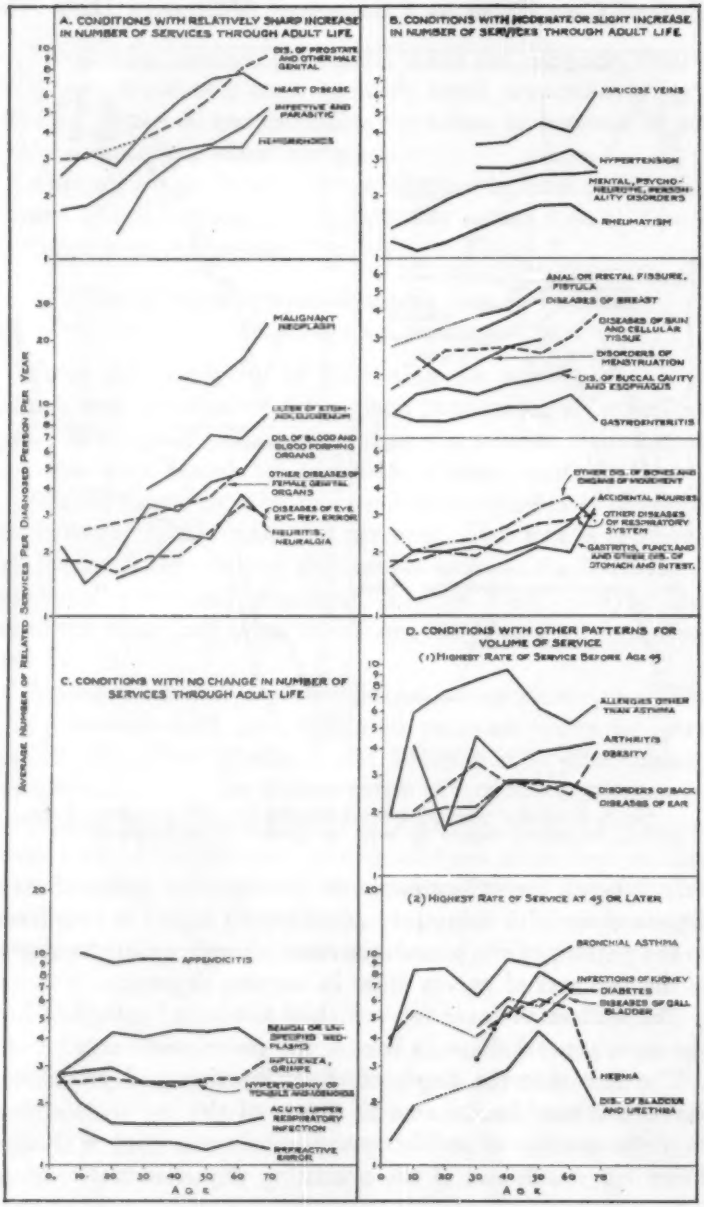

A. CONDITIONS WITH RELATIVELY SHARP INCREASE IN NUMBER OF SERVICES THROUGH ADULT LIFE.
DIS. OF PROSTATE AND OTHER MALE GENITAL
HEART DISEASE
INFECTIVE AND PARASITIC
HEMORRHOIDS
B. CONDITIONS WITH MODERATE OR SLIGHT INCREASE IN NUMBER OF SERVICES THROUGH ADULT LIFE.
VARICOSE VEINS
HYPERTENSION
MENTAL, PSYCHONEUROTIC, PERSONALITY DISORDERS
RHEUMATISM
ANAL OR RECTAL FISSURE, FISTULA
DISEASES OF BREAST
DISEASES OF SKIN AND CELLULAR TISSUE
DISORDERS OF MENSTRUATION
DIS. OF BUCCAL CAVITY AND ESOPHAGUS
GASTROENTERITIS
MALIGNANT NEOPLASM
ULCER OF STOMACH, DUODENUM
DIS. OF BLOOD AND BLOOD FORMING ORGANS
OTHER DISEASES OF FEMALE GENITAL ORGANS
DISEASES OF EYE, EXC. REF. ERROR
NEURITIS, NEURALGIA
OTHER DIS. OF BONES AND ORGANS OF MOVEMENT
ACCIDENTAL INJURIES
OTHER DISEASES OF RESPIRATORY SYSTEM
GASTRITIS, FUNCT. AND OTHER DIS. OF STOMACH AND INTEST.
C. CONDITIONS WITH NO CHANGE IN NUMBER OF SERVICES THROUGH ADULT LIFE.
APPENDICITIS
BENIGN OR UNSPECIFIED NEOPLASMS
INFLUENZA, GRIPPE
HYPERTROPHY OF TONSILS AND ADENOIDS
ACUTE UPPER RESPIRATORY INFECTION
REFRACTIVE ERROR
D. CONDITIONS WITH OTHER PATTERNS FOR VOLUME OF SERVICE
(1) HIGHEST RATE OF SERVICE BEFORE AGE 45
ALLERGIES OTHER THAN ASTHMA
ARTHRITIS
OBESITY
DISORDERS OF BACK
DISEASES OF EAR
(2) HIGHEST RATE OF SERVICE AT 45 OR LATER
BRONCHIAL ASTHMA
INFECTIONS OF KIDNEY
DIABETES
DISEASES OF GALL BLADDER
HERNIA
DIS. OF BLADDER AND URETHRA
AVERAGE NUMBER OF RELATED SERVICES PER DIAGNOSED PERSON PER YEAR
0 10 20 30 40 50 60 70
AGE

Fig. 9. Average annual number of physician services per case for selected categories of disease, by age of patient.

per patient may be of more interest than the utilization rate (services per unit of population).

Services per Patient. Curves showing the variation in average number of services per case are presented in Figure 9 for conditions classified[11] as follows:

1. Conditions with a relatively sharp increase in the average number of services through adult life. (Relatively sharp is defined: the difference between the highest and lowest rates is *more than two-thirds of the value of the lowest point* in the specified age span).
2. Conditions with a moderate or slight increase in the average number of services through adult life.[12] (Moderate or slight is defined: the difference between the highest and the lowest rates is *less than two-thirds of the value of the lowest point* in the specified age span).
3. Conditions with no change in number of services through adult life.
4. Conditions with other patterns. These have been grouped in the graph according to the age at which the highest rate of service appears. All these curves show at least one change in slope; a number of them are bimodal.

Detailed data by age are shown in Appendix I.

There are only six groups of conditions which show a more or less constant rate of service per patient throughout adult life. Three of these are respiratory conditions; the others are benign or unspecified neoplasms, appendicitis and refractive error (Panel C of Figures 9).

Among the conditions shown in Panel A of Figure 9, three of these, which show a sharp increase with age in services per case, also have a marked rise in prevalence with age, thus pre-

[11] These patterns have been established by examining the curves between ages 15 and 64. Except in the case of malignant neoplasms, the point showing average number of services at ages 65 and over has not been used in classifying the curve, because of the low frequencies in this age group. No point has been plotted on any of the curves which is based on less than 15 diagnosed cases.

[12] The curve for services per case of mental illness does not include psychiatric care after diagnosis, which is excluded under the HIP contract. The slope of this curve might very well be quite different were such services included.

senting a double problem in the older ages (*Cf.* Figure 4). These are diseases of the heart, malignant neoplasms, and diseases of the prostate and male genital organs. These conditions contrast with the infective and parasitic diseases which, though showing an increase in services per case, decline in prevalence with advancing age (*Cf.* Figure 2).

In general, Figure 9 brings out the fact that the majority of conditions show an increase with age in the average number of services per case.

Variation with Sex. There are relatively few conditions (of the 36 entities which can be compared) which show an average number of services *per patient* in one sex, which is higher than the rate for the other sex by more than 10 per cent of the lower rate (Appendix I):

Males Higher Than Females	*Females Higher Than Males*
Appendicitis	Obesity
Allergies Other Than Asthma	Diabetes
Diseases of the Ear	Varicose Veins
Diseases of Bladder and Urethra	Hypertension
Nephritis, Nephrosis, Infections of Kidney	
Diseases of the Heart	
Hemorrhoids	
Gastritis; Functional and Other Diseases of Stomach and Intestines	
Anal or Rectal Fissure, Fistula	

Whether these differences mean that illness due to a particular diagnostic condition is more severe in one sex than another, or that there are differences in rates of recovery by sex, or that psychological or social factors play a differential role in determining the number of physician services required by a particular case are all questions for the student of natural history of disease to ponder.

Summary

As chronic illness has replaced acute illness as the major

public health problem, and as efforts to control today's leading causes of death have shifted the emphasis from mortality to the conditions of living, it is increasingly evident that sources other than mortality statistics need to be exploited to provide a picture of the health of the population.

The present paper presents morbidity data derived from the records of a medical care plan, the Health Insurance Plan of Greater New York (HIP). Examples are given of the uses to which such data may be put by medical care plans.

The average annual frequency (prevalence) of various illness conditions is presented. About two out of every five members required some service for respiratory disease during a year. The relative importance in the two sexes of various broad categories of disease is discussed.

Age specific rates for detailed diagnostic categories are shown graphically in such a way as to bring together conditions with similar patterns of variation with age. This form of graphic presentation emphasizes the need for investigations into the natural history of disease. The characteristics of prepaid medical care plans would seem to lend themselves well to such studies.

Prevalence rates for HIP are compared with those published for the Permanente Health Plan in California. There is very good correspondence in the general order of magnitude of the rates for many classes of conditions, but rather wide differences are observed in the rates for respiratory conditions and for arthritis, with HIP having a rate higher than Permanente in both these categories. Comparisons of this type reinforce the idea that much valuable material on the morbidity status of population groups covered by health insurance plans lies in the records of these plans. Systematic study of such material may well provide important insights into the epidemiology of disease.

A comparison is also made between the HIP data for 1948–1951 and data for 1957–1958. Certain changes are noted.

The volume of medical care used by persons with particular

diagnoses is a matter of special interest to those concerned with the development of methods for prepaying for medical care and with administrative mechanisms for providing such care. Data on the number of physician services associated with specific diagnostic categories are presented in several ways: (1) as per cent of total services utilized by a population group of specified age and sex; (2) as utilization rates for specified diseases related to a unit of the population; and (3) as the average number of services rendered each case of specified diagnosis per year. While the utilization rate per unit of population for a given disease category usually varies with age in roughly the same way as the prevalence of the disease, the slopes of the utilization curves are frequently different from those of the prevalence curves. This is most often an expression of the increasing number of services per case of the disease which is required with advancing age.

Detailed tables are presented in the Appendix on all the morbidity measures discussed.

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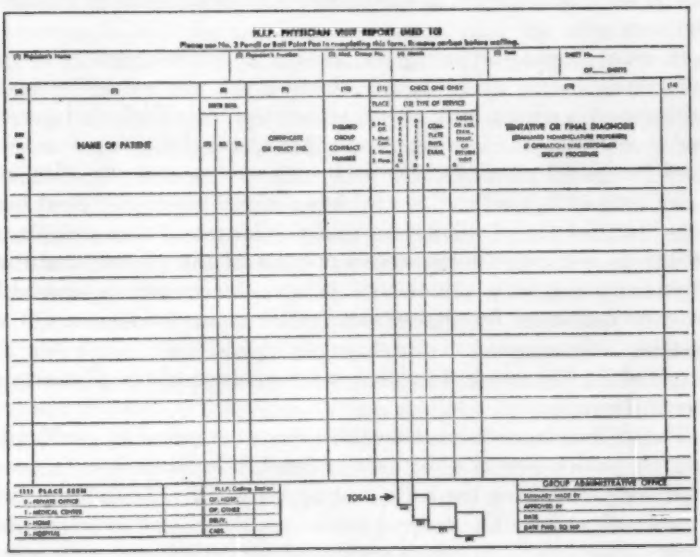
Appendix A.



H.I.P. PHYSICIAN VISIT REPORT (MED 10)

NAME OF PATIENT

TENTATIVE OR FINAL DIAGNOSIS

TOTALS

GROUP ADMINISTRATIVE OFFICE

APPENDIX B

Methodology

1. *Sources of Data.* The counts of persons utilizing HIP physician services for specified diagnostic categories, and the counts of services rendered for such categories, are derived from the basic reporting document filled by HIP physicians—the "Med 10," reproduced in Appendix A. The data on insurance coverage, needed to compute prevalence rates or rates of service per 1,000 population per year, were coded from the HIP Registrar files.

The information which the HIP physician is required to supply each time there is a face to face contact with an HIP patient consists of the physician's name, identification and medical group, the date of service, the name of the patient and his numerical identification (family certificate number and individual sex and family status

code), the contract number under which the patient is insured, the place where the service was rendered (home, office or hospital), an indication of the character of the service (operation, delivery, complete physical examination, etc.), and the diagnosis. If there is as yet no definite diagnosis, the physician is required to enter a tentative one.

In order to produce listings of services in chronological order to individuals in the study sample, from which the morbidity and utilization experience were coded, all services to individuals insured under certificate numbers with a specified terminal digit were underlined for special punching. For each such service, over the calendar years 1948–1951, a utilization card was punched which contained not only identification of the patient and physician and date and place of service, but also the last and first name of the patient, and the physician's diagnosis abbreviated in accordance with a standard glossary developed for this purpose. This abbreviation was *not* a numeric code assigned to the diagnosis entered on a single line of the Med 10, but simply an alphabetic translation of the physician's terminology.

The utilization cards created in this way were sorted by certificate number (which identified the covered family), by birth data (a two-digit code identifying the individual by sex and family status), and by date of service. The ordered cards were then listed to create the basic documents from which coding of morbidity and utilization was done.

2. *Editing of the Coding Listings.* Before any coding was done from these listings a detailed editing procedure was carried out in order to eliminate, wherever possible, errors in the assignment of services to an individual. Such error could arise either in the original recording of the Med 10 in the medical groups or in the punching of utilization cards. The listings were examined for identity of *name* within a block of services with the same certificate and individual number. Where discrepancies existed, correct assignment of the services was made possible through reference to an alphabetic control file which listed every individual in the study, together with the correct certificate and individual number. Other types of error—such as the omission of services—which could be inferred from the diagnostic content of the services listed (such as the appearance of "post-operative" services for a patient for whom no services specifying the

operation were listed) were corrected by referring back to the Med 10's, or, on occasion, to the records in the medical groups themselves.

3. *Coding.* The sample for the entire study consisted of all individuals with certificate numbers ending in a specified digit who had coverage in HIP for any length of time during the calendar years 1948 through 1951. For each individual in the sample a code sheet which provided for the entry of data on coverage status (date of entry, months of coverage during the year, indication of interruptions in coverage) during each of the applicable years was filled from the HIP Registrar history cards. Each code sheet showed the identification of the individual (certificate and individual number), the medical group to which the individual belonged in each of the applicable years, the contractor group under which he was insured, and the family's name.

The coding listings, described above, were now examined for services to all individuals in the sample for whom enrollment experience had already been entered from Registrar files. Coding to be added from the utilization listings specified the volume of service, by place, in each year in which there was coverage, and each diagnostic category for which service was received in the year, together with the number of physician services related to that diagnosis. Indications of hospitalization, of surgery, of death, of service from a physician-specialist in establishing a diagnosis, were also included.

The three-digit code of the International Statistical Classification (1948) was used to characterize a diagnostic category, and rules were established to guide the coders in the selection of these codes. Because the HIP physician is required to write a diagnosis each time he sees the patient, and is required to enter a tentative diagnosis in the absence of a definitive one, and because of the variation in terminology which may be chosen by one or more physicians examining a patient for the same illness over a period of time, it was necessary to study all services to the individual before decision on the number and nature of the codes to be assigned. Three main factors were weighed in all cases where there was some question about the code to be selected:

1. A more fundamental diagnosis was in general preferred to a symptom.

2. A specialist's diagnosis was in general preferred to that of a family physician.

3. Diagnoses made later in time were in general given more weight than those made earlier.

Diagnoses which remained tentative by the end of the calendar year in question were identified as such. If two or more distinct diagnoses were mentioned in connection with a single service, the service was assigned to each such diagnosis. No attempt was made in the coding to identify *episodes* of illness. For example, a patient with service for two separate colds in a given year—with two related services for the first cold and three related services for the second cold—would simply be noted as having received five services for a cold in that year.

In order to test the possibility of applying these coding rules to the HIP utilization data in a consistent manner, the utilization of some 80 persons with successive certificate numbers was coded twice. The first coding was done in the routine manner by the medical coding staff, reviewed by the supervisor who also coded all complex listings referred to her by the coders; the second coding was done completely by the supervisor. A separate set of cards was punched from each of these coding operations, each set was listed completely, and the listings were compared item by item in order to count and analyze any discrepancies. There was some discrepancy in selection of codes involving 31 services out of a total of 776 services (3.9 per cent), but only 3 of these discrepancies had the effect of producing conceptual differences. All three of these differences stemmed from errors in coding rather than from inconsistency of judgment.

4. *Tabulations.* Although a punched card ("enrollee annual summary card") was created for each year in which an enrollee had any coverage, tabulation of morbidity experience was limited to those enrollees who had a full twelve months of coverage in a calendar year. These cards were converted to electronic tape and the basic tabulations were done on UNIVAC. Computation of rates was done from these tables in relation to the population with full calendar years of coverage. Tabulations were obtained to make possible computation of prevalence rates and rates of services related to a specified diagnosis for each of the four calendar years without regard to age and sex, and to allow computation of age-sex specific rates

through massing of the data for the four calendar years. In all cases age was coded as of the calendar year in question.

APPENDIX C

The Completeness of Reporting

Obviously, the reliability of illness rates derived from the HIP operating program is dependent upon the completeness and accuracy with which services rendered to enrollees are reported by the physicians of the Plan. In order to study this question, the number of services and the diagnoses reported on the Med 10's were compared with similar data obtained from the medical records of the physicians in the Medical Groups. The two sets of observations were obtained and analyzed independently[1] for 123 individuals who were covered

Table A. Degree of correspondence between Med 10's and clinical records in *number of services reported*, by physician category and by place of service—comparable services only.[1]

Physician Category; Place of Service	Total Services Reported on Med 10's (a)	Total Services Reported in Clinical Records (b)	Correspondence Ratio (a)/(b)	Med 10 Services Not Found in Clinical Records (c)	Clinical Record Services Not Found in Med 10's (d)	Estimate of Completeness of Reporting—Per Cent[2]	
						Med 10's	Clinical Records
Total Services	1,049	928	1.13[3]	224	103	88.9	78.6
General Physician	624	550	1.13	146	72	86.9	76.6
Specialist	425	378	1.12	78	31	91.8	81.6
Office	794	747	1.06	135	88	88.2	83.0
Home	120	73	1.64	58	11	84.9	51.7
Hospital	135	108	1.25	31	4	96.3	77.0

[1] "Comparable services" are defined as those services reported either on the Med 10's or in the clinical records by physicians whose records were searched for services to the specified patient.

[2] When this ratio was computed separately for each of the calendar years in the study period, there was a definite trend toward greater correspondence in successive calendar years:

1948	*1949*	*1950*	*1951*
1.44	1.16	1.12	1.03

[3] For the Med 10's this estimate is $\frac{\text{No. Services Matched on Both Records}}{\text{No. Services on Clinical Records}} \times 100$.

For the clinical records this estimate is $\frac{\text{No. Services Matched on Both Records}}{\text{No. Services on Med 10's}} \times 100$.

[1] The abstractor was provided with only the name and certificate number of the enrollee at the time she went to the Medical Group. At the time of the study only three of the Medical Groups concerned had unit medical records. (This has since been

(Continued on page 86)

for any period during 1948–1951. These individuals were drawn at random from the total number of individuals included in the study; they contributed 304.4 person-years of experience for analysis.

The correspondence of the two sources of data with regard to volume of services is shown in Table A. The total number of services reported on the Med 10's was greater than that found in the clinical records. This was particularly true for services provided in the home and in the hospital. The discrepancy between the two sets of records decreased over the four year period, the correspondence ratio being 1.44 in 1948 but only 1.03 in 1951.

The data in Table A also show that there were 103 services found in the clinical records which were not found on the Med 10's, but there were 224 services reported on the Med 10's which were not entered in the medical records. The best estimate of the completeness of reporting of Med 10's over the four years then is 89 per cent for the Med 10's and 79 per cent for the clinical records.[2] As noted above, the completeness of reporting of the home and hospital services was much greater on the Med 10's than on the medical records.

In order to compare the extent to which the Med 10's and the clinical records might yield different measures of prevalence for various disease entities, Table B was prepared. Since in the analyses prevalence is defined as the number of persons per 1,000 enrollment receiving one or more physician services for a particular condition in a given year, the comparison here is in number of person-years in which service related to a specified diagnostic category was rendered. On the whole, the two sources of data yield figures of essentially the same order of magnitude. The exceptions to the general picture are diseases of the respiratory system and symptomatic complaints. The former shows a considerably higher figure for the Med 10 records. It is probably these conditions which are most often seen at home. The latter gave a lower figure for the Med 10's than for the clinical records, perhaps because a diagnosis is specifically called for on the report form for each service rendered. In any event, use of the Med

changed). In cases where physicians other than those mentioned by the group's secretary, or other than those mentioned as referrals by the physicians whose records were examined, gave service to the enrollees, it was not possible to compare Med 10 reporting with the clinical records. A total of 349 such services were reported on the Med 10's. These have been omitted from the analyses.

[2] It is, of course, possible that some services were not reported on either the Med 10 or the medical record. There is no way of testing this directly.

Table B. Comparison of Med 10's and clinical records as sources of prevalence data.

Diagnostic Category	Number of Person-Years in Which Service Related to Specified Category Was Rendered	
	Med 10's	Clinical Records
Preventive or Supplementary Service	60	50
Infective and Parasitic Diseases	8	8
Benign and Unspecified Neoplasms	3	5
Allergic, Metabolic, Endocrine and Nutritional	33	27
Hay Fever	6	5
Bronchial Asthma	3	2
Other Allergies	6	4
Diabetes	6	6
Other Endocrine	2	3
Obesity	10	7
Anemias	1	1
Mental, Psychoneurotic and Personality Disorders	16	15
Diseases of Nervous System and Sense Organs	28	25
Neuritis, Neuralgia	4	4
Conjunctivitis	3	3
Refractive Error	4	3
Other Diseases of Eye	2	1
Otitis Media	8	6
Other Diseases of Ear	7	8
Diseases of Circulatory System	27	31
Heart Diseases, except Congenital	8	12
Hypertension	11	8
Diseases of Arteries	1	3
Varicose Veins	3	2
Hemorrhoids	1	2
Other Circulatory	3	4
Diseases of Respiratory System	110	80
Acute Upper Respiratory Infection	70	54
Influenza, Grippe	10	2
Pneumonia	3	3
Bronchitis	11	7
Hypertrophy of Tonsils and Adenoids	3	3
Other Respiratory	13	11
Diseases of Digestive System	27	23
Diseases of Buccal Cavity and Esophagus	3	2
Ulcer of Stomach or Duodenum	6	7
Appendicitis	1	1
Hernia	2	1
Gastroenteritis	5	4
Gastritis; Functional and Other Diseases of Stomach and Intestine	8	6
Diseases of Gall Bladder	2	2

Table B (*Continued*)

Diagnostic Category	Number of Person-Years in Which Service Related to Specified Category Was Rendered			
	Med 10's		Clinical Records	
Diseases of Genitourinary System	13		13	
Cystitis		2		1
Diseases of Male Genital Organs		2		2
Menopause		5		5
Other Diseases of Female Genital Organs		4		5
Deliveries	3		3	
Diseases of Skin and Cellular Tissue	24		25	
Diseases of Bones and Organs of Movement	16		20	
Arthritis		3		3
Rheumatism		4		7
Disorders of Back		2		2
Bunions, Synovitis		5		5
Other Musculo-Skeletal		2		3
Congenital Malformations; Certain Diseases of Early Infancy	1		2	
Symptomatic Complaints	11		24	
Accidental Injuries	12		13	

Note: The data in this table are based on the experience of 123 enrollees selected at random as a subsample of a 0.4 per cent sample of the population enrolled in HIP during the years 1948–1951. These 123 individuals had an aggregate of 304 person-years of exposure.

10 will generally give a higher prevalence figure for respiratory diseases and a lower figure for symptomatic complaints than would have been obtained from the clinical records.

APPENDIX D

Notes on the Meaning of "Prevalence" as Used in This Paper

The prevalence rates presented in this paper are defined as the number of persons who received one or more physician services within the Plan related to the specified diagnostic category in the course of a calendar year per 1,000 persons enrolled. If all HIP enrollees received all their medical care within the HIP system, these rates could be defined as measures of medically attended illness. It is however known that some members of HIP seek outside medical care. The extent to which outside care was sought by persons in this study may well vary with age, with education of the family head, with duration of coverage in the Plan, and with the presence of dif-

ferent categories of disease. For this reason the rates here presented may understate in varying degrees the total amount of medically attended illness and the volume of associated physician services for specified categories of disease.

There are no specific data available to provide a correction for such understatement, where it exists. However, it is known from a household survey conducted in 1952 on a sample of the HIP population, that of all HIP enrollees who consulted a physician in the eight weeks preceding household interview, some 80 per cent consulted HIP physicians only.[1] The experience over an eight-week period cannot reasonably be applied to a period of a year. It is possible that persons diagnosed by an HIP doctor have also gone outside HIP for care. In such an event, these persons would appear in a determination of prevalence, although the number of associated physician services would be understated.

The coding and processing conventions (*see* Appendix B) which were applied to these data impose a number of special considerations which should be noted especially for purposes of comparing these data with those of other investigators.

1. Because the data have been processed to produce "period prevalence" rates, the measures of acute, recurring illnesses (such as colds) must be clearly distinguished from rates which measure *episodes* of such illnesses, i.e., number of colds per person per year. The rates presented here for acute upper respiratory infections must be understood, for example, as the number of persons who sought HIP physician care for this purpose *one or more times in the course of a year,* per unit population. Similarly, the prevalence rates for chronic conditions are in no way comparable to measures of persons disabled with exacerbations of chronic illness. They are, again, simply a measure of the extent to which medical care was sought within the HIP setting for the specified condition one or more times in the course of a year.

2. Because the data here presented are derived from the experience of a restricted population—enrollees with a full 12 months of coverage during any of the four calendar years 1948–1951—there is an

[1] Health and Medical Care in New York City. A Report by The Committee for the Special Research Project in the Health Insurance Plan of Greater New York, Harvard University Press, 1957, p. 85.

understatement of the experience of the following types of persons:

a. Persons who die before December 31 of any of the calendar years.

b. Persons born after January 15 of any of the calendar years.

c. Persons entering or leaving the Plan in the course of the calendar year.

The 10 per cent sample studied over the four-year period produced a total of 72,281 enrollee-years of coverage. The percentage of these contributed by persons with full calendar years of coverage was 83.4 (60,302 enrollee-years). For the individual calendar years, these figures were:

	1948	*1949*	*1950*	*1951*
(1) Total Enrollee-Years	10,491	17,631	21,745	22,414
(2) Enrollees with 12 Mos. Coverage	9,035	11,034	18,949	21,284
(2) as Percentage of (1)	86.1	62.6	87.1	95.0

There is no reason to suppose that omission of persons covered for only part of a year would prejudice morbidity rates except in the case of deaths. It is likely that rates for conditions which are prominent causes of death, such as heart disease and cancer, are somewhat understated.

3. In the course of processing the data to obtain prevalence rates, a person was counted *once* in each year for each of the 122 categories[2] defined in Table 1 for which one or more physician services was given during the year. For example, a person who sustained both a diagnosis of keratitis and corneal ulcer in one year, each of which is coded to diagnostic group 23, would be counted only once. However, the rates for the broad classes of disease, by system, have been obtained by addition, so that there can be duplication of persons counted in the numerator to obtain the rate for the broad class.

[2] The 122 categories used for coding reason for physician service included four for which data are not given in this report. The omitted categories are:
110 Service related to ruling out suspected disease (I.S.C. 793).
111 "Check-up" or "general physical examination" in persons with previously established chronic disease.
112 Service for unknown reason.
122 Adverse reactions to medical and surgical procedures (I.S.C. N997–999).

Age	Both Sexes	Males	Females
All Ages	60,302	31,594	28,708
Under 5	4,135	2,196	1,939
5–14	10,314	5,324	4,990
15–24	3,908	1,736	2,172
25–34	8,064	3,570	4,494
35–44	14,122	7,060	7,062
45–54	11,339	6,376	4,963
55–64	6,123	3,877	2,246
65 and Over	1,405	1,091	314
Unknown Age	892	364	528

Appendix E-1. Study population, 1948–1951. 10 per cent sample of HIP enrollees covered for full 12 months in any of the calendar years 1948–1951, all calendar years combined, by age and sex.

Appendix E-2. Study population, 1948–1951. 10 per cent sample of enrollees covered for 12 months in any of these calendar years, by date of entry into HIP.

Date of Entry	Number of Enrollees in Plan at End of				
	1948	1949	1950	1951	
March 1, 1947–December 31, 1947	6,246	5,963	5,515	5,275	
January 1–January 14, 1948[1]	2,789				
January 15–December 31, 1948	(1,818)[2]	4,189	3,841	3,425	
January 1–January 14, 1949[1]		882			
January 15–December 31, 1949		(9,306)[2]	9,336	8,694	
January 1–January 14, 1950[1]			257		
January 15–December 31, 1950			(3,892)[2]	3,694	
January 1–January 14, 1951[1]				196	
Total Full Calendar Years of Coverage	9,035	11,034	18,949	21,284	*All Years* 60,302

[1] Enrollees entering before January 15 of the specified year and still in the Plan on December 31 of that year were considered covered the full 12 months.

[2] Enrollees entering on or after January 15 of the specified year and still in the Plan on December 31 of that year were considered covered *less than* the full 12 months. Their experience in the year of entry was omitted in computations producing the data for this paper.

Appendix F. Prevalence of disease in HIP by age and sex, 1948–1951. Number of enrollees receiving one or more services related to specified diagnostic category per 1,000 enrollees per year.

Diagnostic Category	HIP Diagnostic Group (See Table 1)	Both Sexes								
		All Ages	<5	5–14	15–24	25–34	35–44	45–54	55–64	65+
Infective and Parasitic Diseases	1,2	38.0	117.8	107.3	23.8	19.8	14.4	11.9	12.6	12.1
Neoplasms	3–5	29.1	9.2	7.7	18.9	32.5	45.5	36.3	28.1	29.2
Malignant	3	3.3		0.3	0.5	1.1	2.6	6.0	8.5	14.9
Benign and Unspecified	4,5	25.8	9.2	7.4	18.4	31.4	42.9	30.3	19.6	14.2
Allergic, Metabolic, Endocrine and Nutritional Diseases	6–12	95.9	76.4	101.5	95.4	108.1	101.7	87.2	92.4	67.6
Bronchial Asthma	7	11.4	16.2	23.4	7.7	7.3	8.1	8.6	10.6	5.0
Other Allergies	6,8	37.9	46.2	56.1	44.3	42.9	40.0	24.9	17.6	16.4
Diabetes	9	6.1		0.5	0.5	1.6	3.8	9.9	22.2	25.6
Obesity	11	26.8	1.9	12.1	28.1	40.7	33.8	30.4	27.8	12.1
Other	10,12	13.7	12.1	9.4	14.8	15.6	16.0	13.4	14.2	8.5
Diseases of Blood and Blood-Forming Organs	13,14	12.9	7.3	8.7	12.3	15.7	14.7	15.8	10.6	13.5
Mental, Psychoneurotic and Personality Disorders	15–17	45.0	13.3	15.1	24.3	64.7	64.9	55.0	41.5	17.1
Diseases of Nervous Systems and Sense Organs	18–30	161.2	190.1	166.2	125.9	130.8	160.8	175.1	174.7	168.0
Vascular Lesions affecting C.N.S.	18	1.1			0.3		0.2	1.9	4.6	8.5
Neuritis, Neuralgia	21,22	15.5		0.7	5.1	14.3	23.2	24.4	22.7	22.1
Diseases of Eye	23–27	86.7	55.1	83.5	80.6	74.3	89.6	101.3	101.7	91.8
Refractive Error	*25*	*38.5*	*2.7*	*31.3*	*46.6*	*29.6*	*42.8*	*55.5*	*41.8*	*31.3*
Other	*23,24,26,27*	*48.2*	*52.5*	*52.2*	*34.0*	*44.6*	*46.9*	*45.9*	*59.9*	*60.5*
Diseases of Ear	28–30	56.0	134.2	80.2	37.4	42.3	45.5	44.6	43.3	42.0
Otitis Media	*28*	*30.0*	*125.5*	*63.8*	*16.1*	*13.6*	*16.5*	*12.5*	*10.6*	*5.0*
Other	19,20	1.9	0.7	1.8	2.6		2.3	2.8	2.4	3.6
Diseases of Circulatory System	31–45	81.9	36.5	38.5	38.6	55.2	79.8	112.9	162.5	205.0
All Diseases of Heart, except Congenital	31–37	19.9	4.8	9.4	12.0	7.9	12.0	28.8	55.2	81.1
Rheumatic Fever and Rheumatic Heart Disease	*31*	*3.9*	*0.5*	*4.4*	*7.4*	*4.0*	*4.9*	*3.3*	*2.9*	
Arteriosclerotic Heart Disease without Hypertension	*32*	*7.5*			*0.5*	*0.9*	*2.8*	*15.1*	*26.9*	*43.4*
Arteriosclerotic Heart Disease with Hypertension	*33*	*2.1*				*0.4*	*0.5*	*3.1*	*9.3*	*15.7*
Hypertensive Heart Disease	*34*	*2.7*				*0.1*	*1.4*	*4.6*	*10.1*	*14.9*
Hypertension	38	20.3		0.4	2.0	8.2	18.1	37.6	55.9	64.8
Varicose Veins	40	7.7		0.4	2.3	6.3	9.5	11.9	15.4	15.7
Hemorrhoids	41	15.9	1.0	0.3	5.9	20.1	28.0	20.7	16.5	13.5
Other	39,42–45	18.2	30.7	28.0	16.4	12.6	12.2	13.8	19.6	29.9
Diseases of Respiratory System	46–52	421.8	888.3	613.1	333.7	374.6	368.1	311.8	279.9	259.8
Acute Upper Respiratory Infection	46	246.0	610.6	385.6	202.1	209.1	199.3	164.9	139.5	111.7
Influenza, Grippe	47	72.9	85.6	90.0	64.0	76.0	78.6	60.1	54.5	46.3
Hypertrophy of Tonsils and Adenoids	50	14.5	73.3	41.8	3.6	4.2	3.9	2.6	1.0	0.7
Other	48,49,51,52	88.4	118.7	95.8	64.0	85.3	86.4	84.1	84.9	101.1
Diseases of Digestive System	53–65	107.9	122.4	77.9	72.7	117.1	118.3	118.0	119.1	106.0
Diseases of Buccal Cavity and Esophagus	53,54	12.3	23.7	12.4	13.1	14.4	11.3	10.0	9.5	5.7
Ulcer of Stomach or Duodenum	55	9.7			0.5	7.7	14.2	16.7	17.6	11.4
Appendicitis	57	3.3	2.2	7.7	6.4	2.7	2.2	1.2	2.0	0.7

Males									Females								
All Ages	<5	5–14	15–24	25–34	35–44	45–54	55–64	65+	All Ages	<5	5–14	15–24	25–34	35–44	45–54	55–64	65+
38.5	122.0	106.3	23.0	19.9	15.3	13.3	14.7	15.6	37.6	112.9	108.4	24.4	19.8	13.6	10.1	8.9	
17.2	7.3	7.7	12.7	19.9	18.3	20.5	24.0	31.2	42.1	11.3	7.6	23.9	42.5	72.8	56.6	35.2	22.3
3.6		0.4	1.2	1.1	1.7	5.6	10.1	17.4	2.8		0.2		1.1	3.5	6.4	5.8	6.4
13.5	7.3	7.3	11.5	18.8	16.6	14.9	13.9	13.7	39.3	11.3	7.4	23.9	41.4	69.2	50.2	29.4	15.9
79.7	93.8	102.7	78.9	84.6	73.1	66.2	75.8	60.5	113.8	56.7	100.2	108.7	126.8	130.3	114.2	121.1	92.4
13.0	22.8	26.5	8.6	7.8	7.8	9.1	13.7	5.5	9.7	8.8	20.0	6.9	6.9	8.5	8.1	5.3	3.2
37.3	55.1	61.2	46.1	41.5	37.1	23.2	18.1	17.4	38.6	36.1	50.7	42.8	44.1	42.9	27.0	16.9	12.7
6.6		0.2		2.2	4.0	9.1	19.9	26.6	5.5		0.8	0.9	1.1	3.5	10.9	26.3	22.3
12.9	1.4	6.2	13.2	24.9	14.9	14.6	12.9	5.5	42.0	2.6	18.4	40.1	53.2	52.7	50.8	53.4	35.0
9.9	14.6	8.6	10.9	8.1	9.3	10.2	11.3	5.5	17.9	9.3	10.2	18.0	21.6	22.7	17.5	19.1	19.1
5.8	7.3	7.9	4.0	0.8	4.7	6.1	6.7	14.7	20.7	7.2	9.6	18.9	27.6	24.6	28.2	17.4	9.6
34.0	14.6	17.8	13.8	57.1	45.2	39.2	29.1	12.8	57.1	11.9	12.2	32.7	70.8	84.5	75.4	62.8	31.8
162.1	197.6	178.6	109.5	126.9	159.2	168.9	166.9	176.0	160.2	181.5	152.9	139.1	134.0	162.4	183.0	188.3	140.1
1.3			0.6		0.4	1.9	3.9	10.1	0.9						2.0	5.8	3.2
13.4		1.1	2.9	10.4	19.7	20.5	20.6	21.1	17.7		0.2	6.9	17.4	26.8	29.4	26.3	25.5
85.1	57.8	91.1	67.4	70.0	85.8	93.9	95.4	95.3	88.5	52.1	75.4	91.2	77.6	93.5	110.8	112.6	79.6
34.9	*3.6*	*34.6*	*38.0*	*24.4*	*35.4*	*48.5*	*38.4*	*30.2*	*42.4*	*1.5*	*27.9*	*53.4*	*33.8*	*50.1*	*64.5*	*47.6*	*35.0*
50.2	*54.2*	*56.5*	*29.4*	*45.6*	*50.4*	*45.4*	*57.0*	*65.1*	*46.1*	*50.6*	*47.5*	*37.8*	*43.8*	*43.4*	*46.3*	*65.0*	*44.6*
60.4	139.8	84.0	37.4	46.5	50.3	49.9	45.9	46.7	51.1	127.9	76.2	37.3	38.9	40.6	37.7	38.7	25.5
32.2	*130.7*	*67.6*	*19.0*	*26.8*	*18.8*	*13.5*	*10.8*	*6.4*	*27.6*	*119.6*	*59.7*	*13.8*	*11.1*	*14.2*	*11.3*	*10.2*	
1.9		2.4	1.2		3.0	2.7	1.0	2.7	2.0	1.5	1.2	3.7		1.6	3.0	4.9	6.4
84.8	44.6	43.2	35.1	53.5	74.8	110.7	156.0	199.8	78.8	27.3	33.5	41.4	56.5	84.8	115.7	173.6	222.9
24.9	5.5	10.5	15.6	9.0	11.9	34.0	66.3	84.3	14.3	4.1	8.2	9.2	7.1	12.2	22.2	36.1	70.0
3.0	*0.9*	*4.3*	*8.1*	*3.4*	*2.7*	*1.9*	*3.4*		*4.9*		*4.4*	*6.9*	*4.5*	*7.1*	*5.0*	*2.2*	
12.2			*0.6*	*1.1*	*4.7*	*22.3*	*36.6*	*51.3*	*2.4*			*0.5*	*0.7*	*0.8*	*5.8*	*10.2*	*15.9*
2.9				*0.6*	*0.7*	*3.6*	*10.8*	*17.4*	*1.2*				*0.2*	*0.3*	*2.4*	*6.7*	*9.6*
2.3					*1.3*	*3.0*	*8.0*	*11.0*	*3.0*				*0.2*	*1.6*	*6.6*	*13.8*	*28.7*
17.5		0.8	2.3	8.4	13.9	30.0	40.0	57.7	23.3			1.8	8.0	22.2	47.4	83.2	89.2
5.9		0.8	2.3	3.9	5.9	9.6	10.8	11.9	9.8			2.3	8.2	13.0	14.9	23.2	28.7
17.6		0.6	4.0	23.0	31.9	22.7	18.3	14.7	13.9	2.1		7.4	17.8	24.2	18.1	13.4	9.6
18.8	39.2	30.6	10.9	9.2	11.2	14.4	20.6	31.2	17.5	21.1	25.3	20.7	15.4	13.2	13.1	17.8	25.5
420.0	929.9	641.6	326.6	357.2	366.9	300.7	277.8	259.4	423.8	841.2	582.8	339.3	388.5	369.4	326.2	283.6	261.1
237.1	624.3	398.4	200.5	189.6	188.8	153.7	127.4	106.3	255.8	595.2	371.9	203.5	224.5	209.7	179.3	160.3	130.6
72.7	89.3	88.5	63.9	75.9	84.3	57.4	56.0	44.0	73.2	81.5	91.6	64.0	76.1	72.9	63.7	52.1	54.1
16.0	84.7	45.6	4.6	5.0	4.7	2.2	1.3		12.9	60.3	37.7	2.8	3.6	3.1	3.2	0.4	3.2
94.2	131.6	109.1	57.6	86.6	89.1	87.4	93.1	109.1	82.0	104.2	81.6	69.1	84.3	83.7	80.0	70.8	73.2
112.7	128.4	80.2	62.8	126.3	123.5	123.3	125.6	105.4	102.5	115.5	75.4	80.6	109.7	113.0	111.2	107.7	108.3
11.5	24.6	12.8	10.4	13.7	10.5	8.9	8.5	5.5	13.3	22.7	12.0	15.2	14.9	12.0	11.3	11.1	6.4
14.1			1.2	12.6	19.1	24.0	23.2	13.7	4.8				3.8	9.2	7.3	8.0	3.2
2.9	1.8	6.4	5.8	2.2	2.3	1.9	2.1	0.9	3.6	2.6	9.0	6.9	3.1	2.1	0.4	1.8	

Appendix F (*Continued*)

Diagnostic Category	HIP Diagnostic Group (See Table 1)	Both Sexes								
		All Ages	<5	5–14	15–24	25–34	35–44	45–54	55–64	65+
Hernia	58	7.5	9.9	2.9	2.6	4.0	6.9	9.8	16.5	17.8
Gastroenteritis	59	24.0	56.6	29.1	19.7	28.1	19.5	17.9	15.7	16.4
Ulcerative Colitis and Chronic Enteritis	60	1.1				1.2	1.1	2.1	2.3	2.8
Gastritis; Functional and Other Diseases of Stomach and Intestines	56,61,63	37.5	25.9	24.4	25.6	45.8	45.8	41.3	37.9	37.7
Anal or Rectal Fissure, Fistula or Abscess	62	3.8	4.1	1.3	2.6	6.4	5.7	3.4	2.3	1.4
Diseases of Liver and Pancreas	64	0.9		0.1		0.4	1.2	1.9	1.3	2.1
Diseases of Gall Bladder	65	7.7			2.3	6.3	10.3	13.7	14.0	10.0
Diseases of Genitourinary System	66–76	80.1	20.3	17.1	55.5	120.4	108.2	103.0	78.9	74.7
Nephritis, Nephrosis; Kidney Infections	66	5.5	3.4	3.1	3.3	4.8	6.4	7.9	6.2	7.1
Diseases of Bladder and Urethra	67	8.5	5.3	2.0	4.4	12.2	10.2	9.2	12.9	11.4
Diseases of Prostate and Other Male Genital Organs	68,69	12.5	9.2	3.3	3.6	10.7	10.5	13.1	32.7	49.8
Diseases of Breast	70	3.9		2.6	3.1	6.0	6.2	4.1	1.1	0.7
Disorders of Menstruation	74	9.5		2.0	20.0	22.4	15.2	5.7	1.1	0.7
Menopause	75	14.1				0.9	18.0	43.1	11.9	
Other Diseases of Female Genital Organs	71–73,76	26.1	2.4	4.0	21.2	63.5	41.8	19.8	12.9	5.0
Deliveries and Complications of Pregnancy	77–81	18.2			33.0	84.7	18.4	0.9		
Deliveries	79,80	11.9			22.5	59.0	10.2	0.3		
Abortions; Complications of Pregnancy and Puerperium	77,78,81	6.3			10.5	25.7	8.2	0.6		
Diseases of Skin and Cellular Tissue	82–90	122.5	121.9	128.7	152.3	142.0	130.4	105.7	88.5	88.3
Infections of Skin and Subcutaneous Tissue	82	31.0	42.8	40.6	31.7	34.2	30.0	23.9	20.9	23.5
Warts	83	9.6	2.9	15.6	15.9	8.9	10.2	6.9	5.9	7.1
Dermatophytosis	84	11.2	2.4	12.6	11.5	14.0	15.2	9.8	7.0	2.8
Dermatitis and Eczema	85,86	30.2	53.4	31.8	27.1	30.1	29.9	25.6	24.8	23.5
Other	87–90	40.4	20.3	28.0	66.0	54.7	45.2	39.6	29.9	31.3
Diseases of Bones and Organs of Movement	91–99	112.3	64.1	49.0	61.2	107.0	135.6	152.3	151.9	138.8
Arthritis	91,92	23.4	1.5	1.5	4.4	11.7	23.7	41.3	56.7	69.8
Rheumatism	93	30.0	3.9	8.3	21.8	40.3	41.9	39.9	29.7	20.6
Disorders of Back	94	17.9	0.5	1.1	9.2	25.7	27.1	25.0	20.3	11.4
Other	95–99	40.9	38.3	38.1	25.8	29.4	42.8	46.1	45.2	37.0
Congenital Malformations and Certain Diseases of Early Infancy	100,101	4.5	16.7	7.8	4.6	1.5	3.0	3.0	2.0	1.4
Symptoms and Ill-Defined Conditions	102–109	65.4	62.6	54.3	49.9	77.0	78.2	64.0	55.2	56.2
Accidental Injuries	113–121	99.7	141.5	141.7	120.3	88.7	84.7	82.9	74.8	71.2
Fractures and Dislocations	113	11.9	11.9	20.5	15.6	9.9	7.9	9.9	10.9	12.8
Sprains and Strains, except of Back	114	21.3	7.5	21.8	39.2	21.1	23.9	20.1	17.5	10.0
Head Injuries	115	5.5	18.1	11.3	5.1	3.3	2.6	2.6	2.8	2.8
Lacerations and Open Wounds	116	18.3	39.7	36.6	16.9	16.1	12.5	10.2	8.2	7.8
Contusions and Superficial Injuries	117	26.6	43.0	36.1	29.9	20.0	21.4	23.6	22.9	29.2
Foreign Body in Eye	118	5.5	1.7	4.7	3.3	7.2	7.2	5.9	5.4	0.7
Burns	119	4.0	9.7	2.8	2.0	5.8	3.8	3.8	2.6	1.4
Other Specified Injuries	120	3.0	5.6	3.4	3.8	3.0	2.5	3.4	0.7	2.8
Injuries Not Otherwise Specified	121	3.6	4.4	4.7	4.4	2.2	2.9	3.4	3.9	3.6

Males									Females								
All Ages	<5	5–14	15–24	25–34	35–44	45–54	55–64	65+	All Ages	<5	5–14	15–24	25–34	35–44	45–54	55–64	65+
12.0	14.6	4.5	5.2	7.3	10.9	14.9	23.2	22.0	2.5	4.6	1.2	0.5	1.3	3.0	3.2	4.9	3.2
24.0	59.7	31.0	17.8	28.9	19.5	16.3	15.5	16.5	24.1	53.1	27.1	21.2	27.6	19.5	19.9	16.0	15.9
1.3				1.1	1.3	2.5	2.3	2.7	1.0				1.3	1.0	1.6	2.2	3.2
37.1	25.0	24.8	17.3	49.3	45.9	40.8	37.9	33.9	37.9	26.8	24.0	32.2	42.9	45.7	41.9	37.9	51.0
4.1	2.7	0.8	4.0	6.2	7.1	4.4	2.8	1.8	3.4	5.7	1.8	1.4	6.7	4.4	2.2	1.3	
1.1				0.6	1.0	2.2	1.8	2.7	0.7		0.2		0.2	1.4	1.6	0.4	
4.7			1.2	4.5	5.9	7.4	8.3	5.5	11.1			3.2	7.8	14.6	21.8	24.0	25.5
36.6	25.0	13.0	13.2	39.5	35.1	39.1	67.8	82.5	128.0	15.0	21.4	89.3	184.7	181.3	185.2	98.0	47.8
6.0	1.8	2.6	0.6	4.2	7.8	9.4	7.5	8.2	5.0	5.2	3.6	5.5	5.3	5.1	6.0	4.0	3.2
5.9	5.9	1.7	2.3	10.6	6.1	5.6	8.5	10.1	11.3	4.6	2.4	6.0	13.4	14.3	13.7	20.5	15.9
23.8	17.3	6.4	8.1	24.1	21.0	23.4	51.6	64.2									
0.8		2.3	2.3	0.6	0.3	0.6	0.3		7.2		3.0	3.7	10.2	12.0	8.7	2.7	3.2
									19.9		4.2	35.9	40.3	30.3	13.1	3.1	3.2
									29.7				1.6	36.0	98.3	32.5	
									54.9	5.2	8.2	38.2	113.9	83.5	45.3	35.2	22.3
									38.2			59.4	152.0	36.8	2.0		
									25.0			40.5	105.9	20.4	0.6		
									13.2			18.9	46.1	16.4	1.4		
125.7	119.3	139.2	168.8	158.8	134.1	105.9	87.7	84.3	119.0	124.8	117.4	139.0	128.6	126.7	105.6	89.9	101.9
33.3	44.6	46.4	36.9	36.4	33.3	26.0	20.4	20.2	28.6	40.7	34.5	27.6	32.5	26.6	21.2	21.8	35.0
9.5	2.7	16.7	16.7	10.4	9.9	6.0	5.9	5.5	9.7	3.1	14.4	15.2	7.8	10.5	8.1	5.8	12.7
13.0	2.3	14.7	16.1	21.8	16.6	10.8	7.2	3.7	9.2	2.6	10.4	7.8	7.8	13.7	8.5	6.7	
29.3	48.3	35.3	24.8	29.7	28.3	23.4	25.0	27.5	31.2	59.3	28.1	29.0	30.5	31.4	28.4	24.5	9.6
40.5	21.4	26.1	74.3	60.5	46.0	39.7	29.1	27.5	40.2	19.1	30.1	59.4	50.1	44.5	39.5	31.2	44.6
113.4	72.4	55.6	67.4	116.8	138.5	135.2	142.1	133.8	111.0	54.7	41.9	56.2	99.2	132.7	174.3	168.8	156.1
19.9	1.8	1.5	1.2	9.0	21.4	28.1	45.1	62.3	27.2	1.0	1.4	6.9	13.8	26.1	58.2	76.6	95.5
32.1	5.0	9.2	24.8	47.3	44.9	41.4	29.9	20.2	27.8	2.6	7.4	19.3	34.7	38.9	37.9	29.4	22.3
19.9		0.8	10.9	35.6	30.3	24.5	22.4	11.9	15.7	1.0	1.4	7.8	17.8	23.9	25.8	16.5	9.6
41.5	65.6	44.1	30.5	24.9	41.9	41.2	44.6	39.4	40.3	50.0	31.7	22.1	32.9	43.8	52.4	46.3	28.7
5.6	19.1	10.9	7.5	2.2	3.4	3.5	2.1	0.9	3.3	13.9	4.4	2.3	0.9	2.5	2.4	1.8	3.2
60.3	63.3	58.8	42.6	67.0	70.8	57.6	49.2	50.4	71.0	61.9	49.5	55.7	85.0	85.7	72.3	65.4	76.4
110.3	161.2	181.6	169.4	102.8	90.2	79.5	67.3	61.4	88.0	119.1	99.2	81.0	77.4	79.2	87.2	87.7	105.1
13.4	12.8	24.8	23.6	12.3	9.3	9.1	8.8	13.7	10.2	10.8	15.8	9.2	8.0	6.5	10.9	14.7	9.6
22.2	8.1	25.5	54.1	24.1	24.8	19.9	14.7	4.6	20.3	6.7	17.8	27.2	18.7	23.1	20.4	22.3	28.7
6.9	19.6	17.1	8.6	4.5	2.5	3.0	2.6	2.7	3.9	16.5	5.2	2.3	2.4	2.7	2.0	3.1	3.2
23.6	49.6	54.3	29.4	18.5	16.0	9.9	10.1	8.2	12.5	28.4	17.6	6.9	14.2	8.9	10.7	4.9	6.4
26.6	47.4	41.7	37.4	22.7	20.0	19.0	18.6	25.7	26.6	38.2	30.0	23.9	17.8	22.8	29.6	30.3	41.1
6.2	1.8	4.9	4.0	9.5	8.1	7.1	5.9		4.7	1.5	4.4	2.8	5.3	6.2	4.4	4.5	3.2
3.5	9.1	3.2	1.7	4.8	3.3	3.3	2.1	0.9	4.5	10.3	2.4	2.3	6.7	4.2	4.4	3.6	3.2
3.6	6.4	4.3	4.6	3.4	2.8	4.7	1.0	1.8	2.4	4.6	2.4	3.2	2.7	2.3	1.6		6.4
4.1	6.4	5.8	5.8	3.1	3.4	3.6	3.6	3.7	2.9	2.1	3.4	3.2	1.6	2.4	3.2	4.5	3.2

Appendix G. Percentage of all services other than "preventive" and for deliveries, by diagnosis, total and each age-sex group.

Diagnostic Category[2]	All Ages[1]		
	Both Sexes	Males	Females
Total Services, excluding "Preventive Services" and Services Related to Deliveries			
Number	248,176	126,681	121,495
Per Cent	100.	100.	100.
Other Supplementary Service	1.9	1.5	2.4
Infective and Parasitic Diseases	2.1	2.2	1.9
Neoplasms	3.8	2.7	4.9
Malignant	1.2	1.3	1.0
Benign and Unspecified	2.6	1.4	4.0
Allergic, Metabolic, Endocrine and Nutritional Diseases	12.7	12.2	13.3
Bronchial Asthma	2.2	2.5	2.0
Other Allergies	6.4	7.0	5.7
Diabetes	1.0	1.0	1.1
Obesity	1.8	0.7	2.9
Other	1.3	1.0	1.6
Diseases of Blood and Blood-Forming Organs	1.0	0.4	1.6
Mental, Psychoneurotic and Personality Disorders	2.5	2.0	2.9
Diseases of Nervous System and Sense Organs	8.4	9.0	7.7
Diseases of Eye	3.8	3.9	3.6
Diseases of Ear	3.1	3.6	2.5
Diseases of Circulatory System	7.5	8.4	6.5
Heart Disease, Except Congenital	3.0	4.0	2.0
Hypertension	1.4	1.2	1.7
Hemorrhoids	1.2	1.4	0.9
Diseases of Respiratory System	19.8	20.7	18.8
Acute URI	11.3	11.3	11.2
Influenza, Grippe	2.7	2.7	2.6
Hypertrophy Tonsils and Adenoids	1.0	1.1	0.8
Other	4.9	5.6	4.2
Diseases of Digestive System	7.9	9.2	6.5
Ulcer of Stomach or Duodenum	1.4	2.1	0.7
Gastritis; Functional and Other Diseases of Stomach and Intestines	1.6	1.8	1.5
Diseases of Gall Bladder	1.0	0.6	1.3
Diseases of Genitourinary System	7.5	5.0	10.1
Diseases of Prostate and Other Male Genital	1.8	3.5	
Menopause	1.4		2.9
Other Diseases of Female Genital Organs	2.1		4.2
Diseases of Skin and Cellular Tissue	7.5	8.1	6.8
Infections, etc.	1.9	2.2	1.6
Dermatitis and Eczema	1.8	1.9	1.7
Diseases of Bones and Organs of Movement	7.1	7.3	6.9
Arthritis	2.1	1.8	2.5
Rheumatism	1.2	1.3	1.1
Disorders of Back	1.1	1.3	0.9
Other	2.7	2.9	2.5
Congenital Malformations and Certain Diseases of Early Infancy	0.5	0.5	0.4
Symptoms	2.9	2.7	3.1
Accidental Injuries	5.0	5.9	4.1

[1] Includes services to persons of unknown age.

[2] Detailed diagnostic categories which account for less than one per cent of total services in the total population are not shown separately in this table. Omitted also are services for unknown reasons.

Males								Females							
<5	5–14	15–24	25–34	35–44	45–54	55–64	65+	<5	5–14	15–24	25–34	35–44	45–54	55–64	65+
9,866	20,568	5,094	12,396	26,955	25,244	19,245	5,898	7,114	15,822	6,104	17,606	33,946	25,706	11,412	1,531
100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
0.3	1.7	1.9	1.5	1.7	1.8	1.0	1.0	0.3	2.8	3.4	3.0	2.5	2.1	1.8	1.2
5.1	5.1	1.5	1.4	1.4	1.2	1.2	1.5	4.9	6.1	2.2	1.7	0.9	0.6	0.9	
0.3	0.8	3.3	3.1	2.2	2.9	4.3	8.3	1.1	0.7	2.8	4.2	7.6	6.2	4.8	5.6
	0.1	0.5	0.6	0.5	1.7	3.0	7.2				0.2	1.0	1.6	2.3	5.1
0.3	0.7	2.8	2.5	1.7	1.2	1.3	1.1	1.1	0.7	2.8	4.1	6.5	4.6	2.5	0.5
5.2	17.2	19.7	16.9	13.3	9.4	9.2	7.4	3.1	16.3	16.9	16.2	14.9	11.0	10.5	6.9
1.9	6.0	2.4	1.7	1.5	1.6	2.7	0.4	0.6	4.9	2.2	0.9	1.9	1.8	1.6	0.5
2.3	9.8	14.6	12.0	9.9	4.6	2.4	2.3	1.9	8.9	8.7	8.0	7.6	2.3	0.8	0.5
			0.4	0.4	1.3	2.7	3.4		0.6	0.1	0.3	0.4	2.3	3.3	2.3
	0.2	0.9	1.9	0.7	0.7	0.5	0.7	0.2	1.3	3.8	4.9	3.2	2.9	2.7	1.6
0.9	1.1	1.7	0.9	0.7	1.2	0.8	0.6	0.4	0.6	2.1	2.1	1.7	1.7	2.2	2.0
0.4	0.3	0.3		0.3	0.4	0.7	2.1	0.3	0.4	1.3	2.3	1.7	2.5	1.6	0.3
0.5	0.8	1.2	3.9	2.8	2.5	1.8	0.6	0.4	0.6	2.0	3.7	3.9	3.5	2.5	2.0
8.3	8.3	6.3	6.6	10.0	9.6	10.1	8.6	8.8	8.8	7.9	6.2	6.7	8.0	10.8	8.0
2.1	4.1	3.2	3.3	3.8	4.3	5.0	4.3	2.6	4.1	4.5	3.4	3.0	3.9	4.9	2.9
6.2	4.0	2.7	2.8	4.3	3.1	2.5	2.1	6.2	4.5	2.7	2.0	1.9	1.9	2.1	0.9
1.7	2.6	2.3	4.0	6.6	12.8	16.6	16.0	1.2	1.9	3.2	4.3	6.2	8.8	14.3	26.8
0.2	1.0	1.1	0.9	1.9	6.0	10.3	9.2	0.4	0.6	1.3	0.9	1.3	3.1	5.4	12.2
		0.1	0.5	0.8	2.2	2.7	2.6			0.1	0.7	1.4	2.5	5.5	6.4
		0.2	1.7	2.4	2.0	1.4	1.2	0.1		0.4	1.0	1.6	1.1	0.6	1.6
52.2	32.9	18.0	17.0	17.3	14.8	10.6	11.4	53.3	35.0	20.8	16.4	13.4	11.7	11.5	10.3
38.4	21.1	10.3	8.6	7.7	5.9	3.8	3.3	41.2	22.7	11.6	9.4	7.1	5.8	5.2	4.6
2.9	3.5	3.2	3.3	3.2	2.3	1.7	1.8	3.2	4.3	3.9	2.8	2.2	2.0	1.9	1.7
5.3	3.2	0.5	0.4	0.3	0.2	0.1		4.1	3.4	0.3	0.2	0.2	0.1		0.1
5.6	5.1	4.0	4.8	6.1	6.4	5.0	6.3	4.8	4.7	5.0	4.0	3.9	3.8	4.5	4.0
5.2	4.6	8.0	9.1	9.9	13.0	11.2	7.7	5.5	5.8	5.3	6.0	7.1	6.9	7.5	6.1
		0.3	1.5	2.5	4.3	3.2	1.9				0.3	0.9	1.0	1.1	2.2
1.1	0.8	0.8	2.4	2.0	2.4	1.5	2.5	0.9	0.9	1.5	1.7	1.9	1.5	1.5	1.4
			0.4	0.7	1.0	1.2	0.4			0.8	0.6	1.8	1.9	2.8	1.6
1.4	1.4	1.9	4.3	4.5	5.5	10.1	12.4	1.1	1.8	7.2	13.0	12.3	14.8	8.6	2.5
1.2	0.5	1.3	2.6	2.5	3.4	8.5	11.0								
											0.2	2.7	8.5	2.7	
								0.3	0.6	3.7	8.4	5.7	3.2	3.4	1.8
4.7	7.4	15.4	11.9	9.9	6.8	5.7	6.1	5.7	7.1	12.9	8.8	6.7	5.2	4.8	7.3
1.9	2.4	3.4	2.6	2.9	1.7	1.4	1.8	2.0	1.9	3.0	2.2	1.5	1.0	1.2	1.7
1.9	1.7	1.8	2.0	2.4	1.6	2.1	1.5	2.6	1.4	2.1	1.9	1.8	1.5	1.1	0.2
4.2	2.6	4.0	7.2	8.8	9.2	9.5	8.8	3.5	2.7	3.5	5.3	6.7	10.7	10.6	7.5
0.1	0.3	0.1	1.5	1.7	2.3	3.3	5.6		0.1	0.4	1.3	1.8	4.6	6.4	5.3
0.1	0.2	1.0	1.9	2.0	1.9	1.0	0.5	0.1	0.3	0.8	1.2	1.2	1.4	1.1	0.8
		0.7	1.9	2.2	1.8	1.4	0.6		0.1	0.4	0.9	1.3	1.4	0.5	0.3
4.0	2.1	2.2	1.8	2.8	3.1	3.7	2.1	3.3	2.3	1.9	1.8	2.3	3.4	2.5	1.1
1.5	1.4	1.0	0.1	0.4	0.2	0.1		2.3	0.9	0.1		0.2	0.2	0.3	0.2
1.8	2.3	1.9	3.4	3.9	2.8	1.6	2.2	2.4	2.3	3.0	3.5	3.9	2.7	2.5	3.0
6.4	9.6	11.8	7.3	4.6	4.5	3.6	3.5	5.1	5.6	5.2	3.5	3.3	3.6	4.6	10.7

Appendix H. Physician services for specified categories of disease in HIP, by age and sex, 1948–1951—number of services for specified diagnostic category per 1,000 enrollees per year.

Diagnostic Category	HIP Code	All Ages			Both Sexes by Age Group[1]							
		Both Sexes	Male	Female	<5	5–14	15–24	25–34	35–44	45–54	55–64	>95
Infective and Parasitic Diseases	1–2	85	90	81	206	195	53	60	48	41	52	63
Neoplasms	3–5	156	108	209	24	25	86	141	224	205	226	410
Malignant	3	48	54	41		2	7	13	35	74	138	358
Benign and Unspecified	4,5	108	55	168	24	23	79	128	189	131	88	52
Allergic, Metabolic, Endocrine and Nutritional	6–12	524	488	564	177	592	521	614	611	458	485	385
Bronchial Asthma	7	93	100	84	58	195	65	46	75	75	113	21
Other Allergies	6,8	263	282	241	88	331	326	358	372	155	91	102
Diabetes	9	43	40	45		10	2	13	19	80	146	169
Obesity	11	73	27	124	4	24	72	137	91	83	65	46
Other	10,12	53	38	70	27	31	57	60	55	64	68	48
Diseases of Blood and Blood-Forming Organs	13–14	43	18	70	15	12	23	51	45	66	50	93
Mental, Psychoneurotic and Personality Disorders	15–17	102	81	124	19	24	47	140	148	135	104	45
Diseases of Nervous System and Sense Organs	18–30	344	360	326	351	300	206	236	353	395	518	446
Vascular Lesions affecting C.N.S.	18	9	9	10			2		1	18	44	52
Neuritis, Neuralgia	21–22	38	33	43		1	7	24	56	56	83	63
Diseases of the Eye	23–27	155	157	152	96	144	112	125	144	183	248	214
Refractive Error	*25*	*50*	*46*	*54*	*4*	*48*	*59*	*40*	*54*	*68*	*54*	*37*
Other	*23–24,26–27*	*105*	*111*	*98*	*92*	*96*	*53*	*85*	*90*	*115*	*105*	*177*
Diseases of the Ear	28–30	127	144	108	254	149	77	87	128	112	117	98
Otitis Media	*28*	*69*	*78*	*59*	*243*	*121*	*32*	*30*	*52*	*36*	*47*	*18*
Other	19–20	15	16	14	1	7	8		24	26	26	19
Diseases of Circulatory System	31–45	308	337	276	61	82	80	156	276	483	786	964
All Diseases of Heart, except Congenital	31–37	125	161	85	12	30	34	33	69	204	425	520
Rheumatic Fever and Rheumatic Heart Disease	*31*	*22*	*13*	*32*	—	*21*	*24*	*18*	*31*	*29*	*18*	
Arteriosclerotic Heart Disease without Hypertension	*32*	*53*	*91*	*11*			*1*	*5*	*21*	*102*	*200*	*228*
Arteriosclerotic Heart Disease with Hypertension	*33*	*21*	*27*	*14*				*2*	*2*	*27*	*109*	*170*
Hypertensive Heart Disease	*34*	*17*	*14*	*20*				—	*8*	*32*	*65*	*92*
Hypertension	38	60	48	72		1	3	22	49	107	187	178
Varicose Veins	40	31	22	41		1	3	22	34	53	61	98
Hemorrhoids	41	48	56	39	1	1	8	47	84	70	57	66
Other	39,42–45	46	51	40	47	49	33	32	41	49	57	102
Diseases of Respiratory System	46–52	815	831	797	2,162	1,194	559	620	651	594	549	591
Acute Upper Respiratory Infection	46	464	453	475	1,625	770	317	337	318	264	217	187
Influenza, Grippe	47	110	110	111	125	136	103	111	113	96	87	95
Hypertrophy of Tonsils and Adenoids	50	39	44	34	197	116	10	10	10	7	4	1
Other	48–49,51–52	202	224	177	215	173	130	162	210	228	241	307

Diseases of Digestive System	53–65	324	368	276	219	180	187	270	358	445	491	389
Diseases of Buccal Cavity and Esophagus	53–54	21	21	22	31	19	23	23	20	19	20	16
Ulcer of Stomach or Duodenum	55	58	85	28			4	30	70	119	121	102
Appendicitis	57	32	31	34	27	77	58	26	21	8	29	9
Hernia	58	39	62	14	39	15	20	16	35	59	89	47
Gastroenteritis	59	31	32	31	71	35	24	36	27	25	24	20
Ulcerative Colitis and Chronic Enteritis	60	9	12	6				20	6	16	15	7
Gastritis; Functional and Other Diseases of Stomach and Intestines	56,61,63	68	70	65	40	30	34	75	84	88	77	122
Anal or Rectal Fissure, Fistula or Abscess	62	15	18	12	11	3	12	25	23	18	6	14
Diseases of Liver and Pancreas	64	11	14	8		—		1	14	29	19	18
Diseases of Gall Bladder	65	39	24	56			13	20	57	65	91	34
Diseases of Genitourinary System	66–76	310	202	429	52	55	137	350	380	457	477	550
Nephritis, Nephrosis, Kidney Infections	66	31	37	25	12	21	6	21	39	44	44	47
Diseases of Bladder and Urethra	67	24	21	28	7	4	8	29	28	38	40	22
Diseases of Prostate, Other Male Genital Organs	68–69	74	141		28	10	16	41	47	76	267	460
Diseases of Breast	70	14	3	27		5	11	19	23	19	7	1
Disorders of Menstruation	74	24		49		5	38	53	41	17	4	1
Menopause	75	59		123				4	64	192	51	
Other Diseases of Female Genital Organs	71–73,76	85		178	6	10	58	184	138	72	64	19
Deliveries and Complications of Pregnancy	77–81	138		291			231	652	142	6		
Deliveries	79–80	100		210			186	479	94	3		
Abortions; Complications of Pregnancy and Puerperium	77–78,81	39		81			46	172	49	3		
Diseases of Skin and Cellular Tissue	82–90	307	325	287	209	256	403	374	351	269	268	337
Infections, Skin and Subcutaneous Tissue	82	79	88	68	80	77	90	88	90	61	66	95
Warts	83	23	22	24	7	43	42	22	21	13	14	15
Dermatophytosis	84	24	27	21	5	26	34	28	33	19	12	3
Dermatitis and Eczema	85–86	75	77	72	89	56	56	72	89	71	85	63
Other	87–90	107	112	102	28	55	180	163	117	104	91	150
Diseases of Bones and Organs of Movement	91–99	292	292	292	160	93	106	226	327	449	496	453
Arthritis	91–92	88	73	104	2	6	7	53	75	157	224	293
Rheumatism	93	48	52	45	5	9	26	57	67	74	54	31
Disorders of Back	94	45	52	37	1	1	16	48	75	71	55	27
Other	95–99	111	114	106	153	77	57	69	110	147	163	102
Congenital Malformations and Certain Diseases of Early Infancy	100–101	19	22	17	77	43	15	2	12	9	8	3
Symptoms and Ill-Defined Conditions	102–109	119	109	130	85	81	72	127	169	122	98	126
Accidental Injuries	113–121	207	236	174	241	277	236	189	168	181	199	262
Fractures and Dislocations	113	54	59	48	44	84	56	46	34	46	67	139
Sprains and Strains, except Back	114	37	41	32	9	31	68	37	40	35	45	19
Head Injuries	115	11	12	9	27	19	9	7	5	8	9	4
Lacerations and Open Wounds	116	36	48	22	61	70	33	36	24	22	16	28
Contusions and Superficial Injuries	117	41	43	39	55	49	51	30	34	40	39	53
Foreign Body in Eye	118	8	10	6	2	6	6	9	10	10	7	1
Burns	119	10	11	10	27	8	4	13	10	10	5	4
Other Specified Injuries	120	5	6	4	9	4	5	5	7	4	1	5
Injuries Not Otherwise Specified	121	6	7	4	6	6	5	5	4	5	9	9

— Rate .50 or less. [1] Data by age for each sex are available on request.

Appendix I. Physician services for specified categories of disease in HIP, by age and sex, 1948–1951—number of services per case of specified diagnostic category per year.

Diagnostic Category	HIP Code	All Ages			Both Sexes by Age Groups[1]							
		Both Sexes	Male	Female	<5	5–14	15–24	25–34	35–44	45–54	55–64	>65
Infective and Parasitic Diseases	1–2	2.2	2.3	2.2	1.7	1.8	2.2	3.0	3.3	3.5	4.2	5.2
Neoplasms	3–5	5.4	6.3	5.0	2.7	3.3	4.6	4.3	4.9	5.6	8.0	14.0
Malignant	3	14.7	14.8	14.7		•	•	•	13.3	12.3	16.2	24.0
Benign and Unspecified	4–5	4.2	4.0	4.3	2.7	3.2	4.3	4.1	4.4	4.3	4.5	3.7
Allergic, Metabolic, Endocrine and Nutritional	6–12	5.5	6.1	5.0	2.3	5.8	5.5	5.7	6.0	5.2	5.2	5.7
Bronchial Asthma	7	8.1	7.7	8.7	3.6	8.3	8.4	6.3	9.2	8.7	10.7	•
Other Allergies	6,8	6.9	7.6	6.3	1.9	5.9	7.4	8.3	9.3	6.2	5.2	6.3
Diabetes	9	7.0	6.1	8.2		•	•	•	4.9	8.1	6.6	6.6
Obesity	11	2.7	2.1	2.9	•	2.0	2.6	3.4	2.7	2.7	2.4	3.8
Other	10,12	3.9	3.9	3.9	2.2	3.3	3.8	3.8	3.4	4.8	4.8	•
Diseases of Blood and Blood-Forming Organs	13–14	3.3	3.1	3.4	2.1	1.4	1.9	3.3	3.1	4.2	4.7	6.8
Mental, Psychoneurotic, Personality Disorders	15–17	2.3	2.4	2.2	1.4	1.6	1.9	2.2	2.3	2.5	2.5	2.6
Diseases of Nervous System and Sense Organs	18–30	2.1	2.2	2.0	1.8	1.8	1.6	1.8	2.2	2.3	3.0	2.7
Vascular Lesions Affecting C.N.S.	18	8.5	6.9	11.3			•		•	9.5	9.6	•
Neuritis, Neuralgia	21–22	2.4	2.5	2.4		•	1.5	1.7	2.4	2.3	3.7	2.8
Diseases of Eye	23–27	1.8	1.8	1.7	1.7	1.7	1.4	1.7	1.6	1.8	2.4	2.3
Refractive Error	*25*	*1.3*	*1.3*	*1.3*	•	*1.5*	*1.3*	*1.3*	*1.3*	*1.2*	*1.3*	*1.2*
Other	*23–24,26–27*	*2.2*	*2.2*	*2.1*	*1.8*	*1.8*	*1.6*	*1.9*	*1.9*	*2.5*	*3.3*	*2.9*
Diseases of Ear	28–30	2.3	2.4	2.1	1.9	1.9	2.1	2.1	2.8	2.5	2.7	2.3
Otitis Media	*28*	*2.3*	*2.4*	*2.1*	*1.9*	*1.9*	*2.0*	*2.2*	*3.2*	*2.9*	*4.4*	•
Other	19–20	8.0	8.7	7.3	•	3.6	•		10.6	9.3	10.5	•
Diseases of Circulatory System	31–45	3.8	4.0	3.5	1.7	2.1	2.1	2.8	3.5	4.3	4.8	4.7
All Diseases of Heart, except Congenital	31–37	6.3	6.5	5.9	2.5	3.2	2.8	4.2	5.7	7.1	7.7	6.4
Rheumatic Fever and Rheumatic Heart Disease	*31*	*5.7*	*4.5*	*6.5*	•	*4.8*	*3.2*	*4.7*	*6.4*	*9.0*	*6.1*	
Arteriosclerotic Heart Disease without Hypertension	*32*	*7.0*	*7.4*	*4.6*			•	•	*7.6*	*6.8*	*7.4*	*5.3*
Arteriosclerotic Heart Disease with Hypertension	*33*	*10.0*	*9.3*	*11.9*				•	•	*8.9*	*11.7*	*10.9*
Hypertensive Heart Disease	*34*	*6.3*	*5.8*	*6.7*				•	*5.4*	*7.0*	*6.5*	*6.1*
Hypertension	38	2.9	2.8	3.1		•	•	2.7	2.7	2.9	3.3	2.7
Varicose Veins	40	3.9	3.7	4.1		•	•	3.5	3.6	4.4	4.0	6.2
Hemorrhoids	41	3.0	3.2	2.8	•	•	1.3	2.3	3.0	3.4	3.4	4.9
Other	39,42–45	2.5	2.7	2.3	1.5	1.8	2.0	2.5	3.4	3.5	2.9	3.4
Diseases of Respiratory System	46–52	1.9	2.0	1.9	2.4	1.9	1.7	1.7	1.8	1.9	2.0	2.3
Acute Upper Respiratory Infection	46	1.9	1.9	1.9	2.7	2.0	1.6	1.6	1.6	1.6	1.6	1.7
Influenza, Grippe	47	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.4	1.6	1.6	2.1
Hypertrophy of Tonsils and Adenoids	50	2.7	2.8	2.6	2.7	2.8	2.9	2.5	2.5	2.5	•	•
Other	48–49,51–52	2.3	2.4	2.2	1.8	1.8	2.0	1.9	2.4	2.7	2.8	3.0

Diseases of Digestive System	53–65	3.0	3.3	2.7	1.8	2.3	2.6	2.3	3.0	3.8	4.1	3.7
Diseases of Buccal Cavity and Esophagus	53–54	1.7	1.8	1.7	1.3	1.6	1.7	1.6	1.8	1.9	2.1	•
Ulcer of Stomach or Duodenum	55	6.0	6.1	5.7			•	3.9	4.9	7.1	6.9	8.9
Appendicitis	57	9.9	10.5	9.4	•	10.1	9.1	9.5	9.5	•	•	•
Hernia	58	5.2	5.1	5.3	3.9	5.3	•	4.0	5.1	6.0	5.4	2.6
Gastroenteritis	59	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.4	1.4	1.6	1.2
Ulcerative Colitis and Chronic Enteritis	60	7.7	9.1	5.8				•	5.6	7.5	•	•
Gastritis; Functional and Other Diseases of Stomach and Intestines	56,61,63	1.8	1.9	1.7	1.6	1.2	1.3	1.6	1.8	2.1	2.0	3.2
Anal or Rectal Fissure, Fistula or Abscess	62	4.0	4.3	3.5	2.7	•	•	3.8	4.1	5.2	•	•
Diseases of Liver and Pancreas	64	12.3	12.9	11.4		•		•	11.8	14.7	•	•
Diseases of Gall Bladder	65	5.1	5.1	5.1			•	3.1	5.6	4.7	6.5	•
Diseases of Genitourinary System	66–76	3.9	5.5	3.4	2.6	3.2	2.5	2.9	3.5	4.4	6.1	7.4
Nephritis, Nephrosis, Kidney Infections	66	5.6	6.1	4.9	•	6.9	•	4.4	6.1	5.5	7.2	•
Diseases of Bladder and Urethra	67	2.8	3.6	2.4	1.3	1.9	•	2.4	2.8	4.2	3.1	1.9
Diseases of Prostate, Other Male Genital Organs	68–69	5.9	5.9		3.0	3.0	•	3.8	4.5	5.8	8.2	9.2
Diseases of Breast	70	3.7	3.4	3.7		2.0	•	3.2	3.7	4.5	•	•
Disorders of Menstruation	74	2.5		2.5		2.4	1.9	2.3	2.7	2.9	•	•
Menopause	75	4.2		4.2				•	3.6	4.5	4.2	
Other Diseases of Female Genital Organs	71–73,76	3.2		3.2	•	2.5	2.7	2.9	3.3	3.6	5.0	•
Deliveries and Complications of Pregnancy	77–81	7.6		7.6			7.0	7.7	7.7	•		
Deliveries	79–80	8.4		8.4			8.3	8.1	9.2	•		
Abortions; Complications of Pregnancy and Puerperium	77–78,81	6.2		6.2			4.3	6.7	5.9	•		
Diseases of Skin and Cellular Tissue	82–90	2.5	2.6	2.4	1.7	2.0	2.6	2.6	2.7	2.5	3.0	3.8
Infections of Skin and Subcutaneous Tissue	82	2.5	2.7	2.4	1.9	1.9	2.8	2.6	3.0	2.5	3.2	4.1
Warts	83	2.4	2.3	2.5	•	2.7	2.7	2.5	2.1	1.9	2.4	•
Dermatophytosis	84	2.1	2.0	2.3	•	2.0	3.0	2.0	2.2	2.0	1.7	•
Dermatitis and Eczema	85–86	2.5	2.6	2.3	1.7	1.8	2.0	2.4	3.0	2.8	3.4	2.7
Other	87–90	2.7	2.8	2.5	1.4	2.0	2.7	3.0	2.6	2.6	3.0	5.1
Diseases of Bones and Organs of Movement	91–99	2.6	2.6	2.6	2.5	1.9	1.7	2.1	2.4	2.9	3.3	3.3
Arthritis	91–92	3.8	3.7	3.8	•	4.1	1.6	4.5	3.2	3.8	4.0	4.2
Rheumatism	93	1.6	1.6	1.6	1.2	1.1	1.2	1.4	1.6	1.8	1.8	1.5
Disorders of Back	94	2.5	2.6	2.4	•	•	1.7	1.9	2.8	2.8	2.7	2.4
Other	95–99	2.7	2.8	2.6	2.6	2.0	2.2	2.3	2.6	3.2	3.6	2.8
Congenital Malformations and Certain Diseases of Early Infancy	100–101	4.3	3.9	5.1	4.6	5.5	3.3	•	4.1	3.0	•	•
Symptoms and Ill-Defined Conditions	102–109	1.8	1.8	1.8	1.4	1.5	1.4	1.7	2.2	1.9	1.8	2.2
Accidental Injuries	113–121	2.1	2.1	2.0	1.7	2.0	2.0	2.1	2.0	2.2	2.7	3.7
Fractures and Dislocations	113	4.6	4.5	4.7	3.7	4.1	3.6	4.6	4.2	4.6	6.1	10.8
Sprains and Strains, except Back	114	1.7	1.8	1.6	1.2	1.4	1.7	1.8	1.7	1.7	2.6	•
Head Injuries	115	1.9	1.8	2.2	1.5	1.7	1.7	2.1	2.0	3.2	3.4	•
Lacerations and Open Wounds	116	2.0	2.0	1.8	1.5	1.9	1.9	2.2	1.9	2.2	1.9	•
Contusions and Superficial Injuries	117	1.5	1.6	1.5	1.3	1.4	1.7	1.5	1.6	1.7	1.7	1.8
Foreign Body in Eye	118	1.4	1.5	1.3	•	1.4	1.8	1.3	1.3	1.8	1.3	•
Burns	119	2.5	3.0	2.1	2.8	2.7	•	2.3	2.8	2.7	1.9	•
Other Specified Injuries	120	1.7	1.5	1.9	1.7	1.1	1.3	1.8	2.7	1.3	•	•
Injuries Not Otherwise Specified	121	1.6	1.7	1.5	1.3	1.4	1.2	2.2	1.4	1.5	2.4	•

• Less than 15 cases. [1] Data by age for each sex are available on request.

ANNOTATIONS

AFRICA: ITS PEOPLES AND THEIR CULTURE HISTORY[1]

PROFESSOR MURDOCK'S book makes two major contributions to knowledge about African peoples. It provides, in the first instance, a comprehensive ethnographic survey of the whole continent, including the Mediterranean region and Madagascar. Anyone working on African materials is immediately impressed with the bewildering multiplicity of tribal names. About 5,000 are listed in the index of this book. Some are mere alternative appellations; others designate divisions or combinations of various groups. Actually, of course, minor ethnic divisions in Africa are frequently more or less fluid and may be described in different terms by members of the same community. So the over-lapping series is shaken down to about 800 primary units. These are grouped by Murdock into about 100 clusters or cultural "provinces." Each of these larger groups is treated in its ecological and cultural context. There are frequently important ecological and cultural differences between groups within the same province, or even within a group treated here as a primary unit. Nevertheless, this systematic classification of African peoples, though subject to many possible modifications, is a valuable tool for all persons engaged in studies or administrative activities concerning Africans.

Secondly, the framework used in this classification is a reconstruction of the formation and distribution of the population of Africa and its diverse cultures. The development of this historical framework is the exciting aspect of the exposition. It involves a hundred or more independent judgments, frequently

[1] Murdock, George Peter: AFRICA: ITS PEOPLES AND THEIR CULTURE HISTORY. New York, McGraw-Hill Book Company, Inc., 1959. 456 pp. $8.75.

at variance with the opinions of other scholars, formed by studying convergent lines of evidence and welded into an architectonic structure. This structure makes sense in a large way. No one is infallible, and presumably some of Professor Murdock's judgments are erroneous. Undoubtedly, he will provide happy hunting for many specialists in various fields and on particular societies. They will in some cases be exasperated by the author's failure to provide detailed documentation concerning the grounds for his conclusions. But, in the opinion of the reviewer, the broad outlines of this structure are likely to endure and, with various revisions and enlargements, to become part of all future systematic treatments of African peoples and their cultures.

Early records concerning the parts of Africa and the oceanic trade routes known to ancient and medieval writers are, of course, taken into account, as well as ethnographic information on other parts of the world. The treatment is then developed with primary reliance on three major lines of evidence (1) linguistic relations, (2) knowledge about the origins and distribution of domestic plants and animals, and (3) the analysis of cultures. On the first of these subjects, Murdock relies on the preceding revolutionary and architectonic work of another American scholar, Joseph H. Greenberg. In fact, Murdock's work seems to have been, in part, inspired by Greenberg's studies. The latter are still undergoing extensive revisions but, again, the main lines of the analysis are standing up under criticism by others and his own continued investigations. Work on the "cultigens" of domestic plants and animals is going forward rapidly, but some of the findings already established in this field have far-reaching importance. One important finding, cited in a footnote, apparently came to the author's attention as his work was approaching completion—namely, the indigenous development of one species of rice in the western coastal region of Africa. Murdock integrates his extensive knowledge on the present distribution of domestic plants and animals with that of botanists and geneticists. The author himself has for a long time been a leader in the dynamic analysis of social structure and culture, though he gives rather less attention than might be expected to the treatment of material objects: tools,

weapons, and works of art. For example, he never suggests the possible importance of the development of axes, stone or iron, in the expansion of the Bantu people through the conquest of forest regions with slash-and-burn agriculture. Similarly, although he uses archeological evidence, he does so rather sparingly and with much selectivity. For example, he merely refers to the "Sangoan culture" of West Central Africa without giving attention to its important variations and modifications through the middle and late paleolithic into the neolithic period. He also gives only slight attention to the important new lines of evidence now being developed in physical anthropology, including the very considerable and detailed information on blood groups in African populations.

One of the most exciting features of his exposition is his analysis of evidence on the early independent development of agriculture by Negroes in the upper and middle Niger region, and the movement of plants from this Sudanic agricultural civilization eastward to the region of the Upper Nile prior to the spread of agricultural practices southward and westward from southeast Asia, southwest Asia, and Egypt. Murdock posits, among these early counter-currents, an introduction of Malayan techniques, plants and people who may subsequently have formed the base population of Madagascar, probably from Borneo, the introduction of domestic animals from Asia and Europe through Egypt, and the formation of secondary centers of influence in the middle Nile valley and in Ethiopia. The importance in the African economy of plants introduced by the Portuguese in the fifteenth century from the Caribbean and Brazil, including maize, manioc, and bananas, is well known; but the importance of indigenous African plants in the economy of India has not been generally recognized. Also, if Murdock is right, the cultivation of cotton was initiated in western Sudan.

The reviewer suspects that Murdock's picture of the distribution of races in Africa at the dawn of the neolithic is oversimplified. He tends to equate pygmies with the Sangoan culture and Bushmen with the Stillbay culture, though he does suggest some reservations on both scores in the text. Early skeletal material is very scanty in West Africa, but specialists on the skeletal material of East Africa are impressed with the

variability of their material as pointing toward more complex interpretations. Perhaps Murdock does not make adequate allowance for the possible complete absorption by expanding nations of various racial lines in the thin paleolithic population of central, southern, and eastern Africa. However, even if rather important modifications may be required by the author's neglect of some available information and by new discoveries, these need not alter the main lines of his exposition.

This study has several interesting implications for demography. It suggests the possibility of a standard system of classification of tribal affiliations by broad ethnic groups, with allowance for more detailed information wherever possible, especially for use in censuses—analogous to the broad and detailed classifications used in grouping types of economic activity. It seems important that statistical officials and anthropologists cooperate in the development of ethnic classification systems in order that comparable and useful information can be obtained in large-scale inquiries. Some agency, such as the International African Institute, UNESCO, or the United Nations Economic Commission for Africa, might do well to establish a technical committee on this subject.

Other more theoretical implications concerning past and future trends of African populations are implicit in this study. The author points out that the scarcity and irregularity of water supply in large parts of the continent has severely limited population levels. A region could not permanently maintain a larger population than it could support in years of drought. This factor, plus the low fertility of many African soils, has severely checked population increase. On the other hand, the introduction of new technologies has repeatedly given rise to great population expansions. Small groups that first acquired new techniques increased rapidly and spread out to occupy lands previously held by other technically less advanced people. There was, it seems, a major expansion of Negro tribes in the western Sudan about seven thousand years ago. An increase of population in the western forest zone may have begun with indigenous plants. but the great expansion, according to Murdock, came later with the introduction of species from Indonesia. The most dramatic movement of this sort was the

tremendous increase and spread of small Bantu-speaking groups from the vicinity of eastern Nigeria or the Cameroons across the vast relatively empty spaces of central, eastern, and southern Africa. The present Bantu-speaking population of about 65 million persons was apparently formed on a small base in the course of some two thousand, possibly three thousand, years along with an absorption of smaller linguistic groups. This is entirely possible. A thousandfold increase, say, from 65 thousand to 65 million, in the course of two thousand years would result from an average increase of slightly less than 3.5 per thousand per year, or about 10 per cent per generation. At the same average rate of increase over three thousand years, this population could have been formed on a base of less than two thousand persons. The expansion of Arabs during the last 1,300 years has been even more rapid, but this has involved more large-scale absorption of other elements, largely by means of polygyny.

Similar though less dramatic increases and expansions of population came about in other regions with the acquisition of new techniques, including the later southward movement of farming and herding peoples from the upper Nile valley and the eastward spread of the Fulani across the Sudan. Other great population movements came about through chain reactions to successive intrusions from Asia, notably the movement of Arabs across North Africa and the eastern Sudan. The cultural life of Africa must have been profoundly influenced by these successive movements, conquests, and infusions. Murdock comments on the prevalence of a pattern of "African despotism" for which he sees no simple interpretation—in contrast to the oriental despotisms which he views, following Wittfogel, as based on "hydraulic civilizations." He suggests that African despotism may stem from the wide prevalence of slavery in ancient Africa. But why the prevalence of slavery? May not both these phenomena, as well as the pattern of polygyny, have been influenced by the expansive movements of people in a continent without ample resources or geographic shields for the development of secure, sedentary civilizations?

Finally, the past increases of population with slow advances in techniques suggest the possibility of even more rapid future

increases with the introduction of new scientific techniques, including new means for the control of disease. Meanwhile, the traditional readjustment of population through the movement of people in blocks is being replaced by massive labor migrations and the growth of cities. These prospects bring a series of new and very complex problems.

FRANK LORIMER

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AMERICAN MARRIAGE AND DIVORCE[1]

STUDENTS of migration have complained on occasion that migration statistics are the "poor cousins" in the demographic field. This dubious distinction seems also to be claimed for another area of demography. In the book under review, Jacobson states "Marriage and divorce statistics are today the least developed branch of American vital statistics." (p. 9)

The poor state of marriage and divorce statistics in the United States is perhaps one of the prices we pay for "states rights." As explained by Jacobson, "The United States is the only major country without a system of centralized collection of marriage and divorce records." (p. vii)

Whereas the United States has the longest chain of uninterrupted decennial censuses, it was a late comer in the development of national vital statistics. The reason is that whereas there was constitutional provision from the outset for a federal decennial census, the registration of births, deaths, and other vital events was left to the individual states.

Recognizing the need for national vital statistics, leaders in the field succeeded in starting a death registration area in 1900 and a birth registration area in 1915. Given standards of registration were required for admission and since 1933 all states of continental United States have been included.[2] Our National Office of Vital Statistics receives continuous reports on births

[1] Jacobson, Paul H.: AMERICAN MARRIAGE AND DIVORCE. New York, Rinehart & Company, 1959, 188 pp., $12.00.

[2] Alaska was admitted to the birth and death registration area as a territory in 1950. Hawaii was admitted to the death registration area in 1917 and to the birth registration area in 1929.

and deaths from the various states. It compiles and publishes national tables on these subjects.

An encouraging beginning has been made toward the strengthening of national marriage and divorce statistics through the establishment of marriage and divorce registration areas. Yet the author rightfully says that "with respect to marriage and divorce, the information available for our country is woefully inadequate." (p. 1) The National Office of Vital Statistics publishes estimates on annual numbers of marriages and divorces occurring in the Nation as a whole. More detailed data relate to "reporting states." Jacobson has utilized the available published materials. He has also collected much basic data from many marriage license bureaus and courts in which divorce decrees were given in order to patch together something like a national picture on various aspects of marriage and divorce.

As described by the author, "This book deals with the *occurrence, duration,* and *dissolution* of marriage in the United States. For the first time, nationwide data are made available on such topics as the chances of marriage and of remarriage, the frequency of religious ceremonies, the duration of marriage and of widowhood, the chances of celebrating wedding anniversaries, the frequency of racial intermarriage, and the probabilities of divorce and of widowhood. Other topics are Gretna Greens, effectiveness of premarital regulations, seasonal pattern of marriage, interval between divorce and remarriage, stability of war and of depression marriages, causes of divorce, children in divorce, orphanhood, divorce proceedings, and alimony. Divorce and annulment in South Carolina and New York, and migratory divorce are reviewed in detail. Also highlighted are the changes in trend engendered by the depression of the 1930's and by World War II. Most subjects cover events of the twentieth century; some antedate the Civil War." (p. vii)

In this reviewer's opinion, this is a very valuable book. Doubtless it represents years of toil and worry on the part of the author. It bears witness to long hours of research in law libraries as well as collection and analysis of statistical data described above.

Probably the book will be criticized by some as being only a statistical and legal handbook of marriage and divorce. It is true that the author has not taken advantage of the opportunities offered by data for some states to analyze marriage and divorce in relation to certain social and economic variables. However, the author's chief interest apparently was to provide as much data on a national basis as possible. In this reviewer's opinion this is a scholarly book which analysts will consult repeatedly in the years to come. Although the author sticks close to the factual situation and does not discourse much on broad social implications, he easily inspires confidence that he knows whereof he speaks.

It should also be said that the author's terse factual sentences often serve to expose the hypocrisy engendered by some of the state laws on grounds of divorce. They tell of the shoddy consequences such as the subterfuge of the professional "co-respondent" in New York, the divorce mill in Reno, and the efforts of several other states (and Mexico) to cut in on the divorce racket.

The author comes nearest to carrying the torch himself on a purely technical matter. He takes the Census Bureau to task for its practice of lumping the annulees with the "single" rather than with the divorced. He admits that the practice causes little difference to the percentages single and divorced for the country as a whole. He points out, however, that it does affect the data for New York and California where annulments are frequently resorted to because of the restricted grounds for divorce. The National Office of Vital Statistics does combine the reported annulments with the divorces in preparing the annual rates from registration data.

Except for the annulments the author rather purposely avoids the role of the reformer. He emphasizes that the legal grounds for divorce may have little or no relation to the underlying causes of marriage failures. But on this point he also displays his tolerance and understanding. "As John Milton pointed out in his THE DOCTRINE AND DISCIPLINE OF DIVORCE during the seventeenth century, no court is capable of inquiring into 'the secret reason of dissatisfaction between man and wife'. . . . A multiplicity of studies have advanced numerous hypotheses

and explanations for the social and individual situations which lead to divorce. However, in most instances it may be nothing more than the fact that when the spark of love, of comradeship, and of mutual respect no longer exists in a marriage, the relationship has no further meaning for the couple concerned." (p. 126)

CLYDE V. KISER